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ORGANOTHERAPY*

BY

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At the outset I must insist that this is a discussion on organotherapy and not on endocrinology in general. I have said before that organotherapy of necessity lags behind endocrinology, which is as it should be; the scientific foundation must be secure before intelligent therapy is possible. Of late, however, therapy has made rapid advances, principally in relation to the sex hormones. This discussion is therefore timely, and should provide a useful antidote to the unscientific exploitation of endocrinology which is rife to-day. Every scientific advance seems doomed to be dogged and shadowed by a new quackery: hypnotism, electricity, light treatment, psychotherapy, and vaccines have each in turn suffered this, and it is too much to expect that biochemistry would escape. I read in a lay paper recently that 90 per cent. of bodily troubles were due to glands, and it was implied that they could be remedied by gland treatment. Organotherapy may well pray to be delivered from such friends!

My remarks will be almost entirely concerned with general principles, for I am to be followed by a number of speakers whose own researches have added to our knowledge and who will speak from their own experience on various topics. It is of interest to me to recall that the whole subject has grown up in my own professional lifetime. For it was in my second year at Cambridge that G. R. Murray first successfully treated a case of myxoedema by thyroid extract. He had been told he might just as well expect to treat tabes with an emulsion of spinal cord, so little had Claude Bernard's conception of internal secretion taken hold of the profession. We must not complain of scepticism, however, considering how much damage credulity has done. But it did seem to me that the late Professor Swale Vincent erred on the side of caution when he maintained that the fact that a juice possessing certain pharmacological properties could be squeezed out of the pituitary body threw no light on the function of the gland. Even as recently as 1921 Sir James Berry announced himself an impenitent sceptic as to the parathyroids having any separate function from the thyroid.

Three Lines of Advance

Starling's conception of a chemical control of the body by hormones which he enunciated in 1905 found powerful support, however, in three subsequent discoveries: first, of vitamins—exogenous hormones, as they have been called; and, secondly, from the observations of Loewi and of Dale, from which we learned that the secretion of adrenaline and pituitrin by structures of nervous origin are only special instances of a general law—namely, that a chemical substance is liberated at every nerve-ending on stimulation. In Hopkins's illuminating phrase—chemical substances produced locally and temporarily translate for the tissues the messages received through the nerves. The histamine-like substance and the P-substance described by Lewis as playing an important part in manifestations of allergy and of pain constitute another instance of the chemical control of the body. A third line of advance was the discovery by the Needhams and Waddington that Spemann's organizer in the embryo was not cellular but chemical in its activities, and that it was closely related to oestrin. The relation between the stimulants to normal and abnormal growth has been ably demonstrated by J. W. Cook and E. C. Dodds (1934), and we know that from sterols normally occurring in the body a deranged metabolism may produce specific carcinogenetic substances which will stimulate certain cells to wild proliferation. There is indeed considerable overlap between the chemical constitution of certain hormones, vitamins, and carcinogens. Further, the co-operation of organic chemists with the biologists has led to the preparation of synthetic hormones, and it has been found that simpler chemical substances than those existing in Nature may be adequate to produce the biological effect. These basal groups are, in Dodds's happy phrase, skeleton keys which can pick the physiological lock. We are learning, too, that some of them can have other than their normal specific effects—these are, as he says, pass-keys.

Antihormones

Hormones belonging as they do to the innate defences of the body, it was assumed for a good many years that they would not act as antigens. Doubts on the truth of this generalization were first thrown by J. B. Collip's (1934, 1935) observation that parathormone gradually lost its effect on repeated injection. Subsequently the existence of antihormones was established for the gonadotropic growth and ketogenic hormones of the pituitary and suspected for the diabetogenic and adrenotropic hormones. Collip regards a hormone-antihormone linkage as a normal condition, but there is no evidence that these "anti" substances are produced in the endocrine glands (Loeser, 1937). Nevertheless they are not merely precipitin re-

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actions, for they have been obtained against protein-free extracts, and although not always specific for the particular animal, they are absolutely specific for the individual hormone. It is of interest to note that while the antibodies for tropic hormones can be transferred from one animal to another, the antibodies for simpler hormones, such as parathormone, thyroxine, adrenaline, and insulin, cannot be so transferred (Bauer and others, 1936, 1937).

Hormones and Mineral Metabolism

A further advance in organotherapy was made when the interaction between hormones and mineral metabolism was realized. This was first recognized in the instance of calcium and phosphorus in relation to parathormone, but, not long after, the importance of sodium and potassium ions in relation to the adrenal cortical hormone was discovered. It is now claimed by Rivoire (1937) that just as generalized osteitis fibrosa is associated with a parathyroid adenoma, so myasthenia gravis is associated with a thymic adenoma, as indeed others have observed, and that just as sodium does good and potassium harm in adrenal cortical deficiency, so potassium is beneficial and sodium harmful in myasthenia gravis. Dr. R. S. Aitken informs me, however, that he has not found potassium salts of much benefit in myasthenia gravis. When we add to this list the well-recognized association between the thyroid and iodine and also between haemopoietin and iron in metabolism, it is clear that there is a field for research on the connexion between hormones and mineral metabolism. While on this topic it may be relevant to mention H. Zondek's (1935a) conception of hormones circulating in the blood in an inactive form, and only being activated on reaching their destination, where their action as physical catalysts is modified by electrolytes. Thus he claims that calcium inhibits and potassium increases the effect of thyroxine on the cell. Such matters, however, remain chiefly of academic interest at present, but I hope I have cleared the way for a consideration of the general principles of organotherapy.

Three Postulates for Rational Organotherapy

We may lay down these postulates for rational organotherapy:

A. The gland in question forms an internal secretion.

B. The active principle or principles of this secretion can be extracted.

C. A method of administration of this extract is available which will admit of its utilization by the body.

If and when these postulates have been fulfilled, organotherapy may be employed in the following ways.

1. *As Substitution Therapy.*—To replace the absent or deficient secretion of a gland that is involved in a destructive lesion, or where there is relative insufficiency owing to overaction of some antagonistic gland. Here the hormone is intended to produce a chronic effect. It is only necessary to instance thyroid extract and insulin as examples, and I select them for this reason. For success it must be possible for intermittent doses to replace satisfactorily the slow and more constant secretion which normally occurs. Thyroid extract does this most satisfactorily, and the recent work on insulin has been directed towards slowing down its effect by combination with protamine and zinc so as to imitate more closely the conditions obtaining in the body. On the subject of the effective absorption of hormones and the methods of prolonging their action I may refer you to the paper by Dr. A. S. Parkes (1938). It is important to observe that substitution therapy does not imply that thereby the body may be induced to form its own hormone; indeed, the evidence is all against any such effect.

2. *As Pharmacological Agents.*—Where their known physiological action may be useful, quite apart from any recognizable defect in the patient's own glands. Here a sudden effect is usually aimed at. The injection of adrenaline for the relief of an asthmatic paroxysm is a well-recognized example of this. The production of insulin shock in the treatment of schizophrenia might be cited as another example, though recent observations (Salm, 1937) on the damage which can be wrought on the nerve cells by this procedure should give us pause.

3. *As an Antagonist to Another Hormone.*—Here we can instance insulin in the treatment of hyperthyroidism, pitressin and adrenaline as antagonists to insulin, also oestrin in the attempt to neutralize an overacting pituitary, which has perhaps been more successful in menopausal disturbances than in other directions, though Kirklin and Wilder (1936) claim success for oestrone in the relief of acromegaly. Zuckerman showed that testosterone suppressed ovulation in monkeys, while Loeser found clinically that it led to atrophy of the endometrium and was of therapeutic value in menorrhagia. Levy Simpson (1938) has also used it with some success as a method of neutralizing the thyrotropic hormone in hyperthyroidism.

4. *To Influence General Metabolism.*—Thyroid may certainly help to quicken up general metabolism if it is desired to do so, even in the absence of hypothyroidism. Insulin, adequately covered by dextrose, is often helpful in anorexia nervosa and other wasting diseases. It is claimed for oestrin that it has a favourable influence on impaired carbohydrate metabolism; indeed, Glen and Eaton (1938) found that dihydroxyoestrin increased sugar tolerance in a severe insulin-resistant case of diabetes. But as this effect is presumably antagonistic to the diabetogenic pituitary hormone it should perhaps be classed under heading No. 3.

5. *As an Attempt to Utilize Antihormonal Activity.*—There are two possible therapeutic applications of antihormones to correct over-activity of endocrine glands: (*a*) *passive neutralization* by means of the antihormone produced in another animal by injecting it with the corresponding hormone, and (*b*) *active antagonism* by injecting the patient with sub-threshold doses of the hormone in question and thus causing him to produce his own antihormone. The first method has had some limited success experimentally, and Loeser (1937) found the antithyrotropic hormone effective even when given by the mouth. I am unaware, however, of any clinical successes by this method. The second method, although imitating vaccine therapy, does run the risk of aggravating the disease. Hertz and Hisaw (1934) have succeeded with subthreshold doses of gonadotropic hormone in rendering an animal's ovaries resistant to subsequent large and usually effective doses.

It must be admitted, however, that antihormonal action has so far proved a hindrance rather than a help to organotherapy, particularly so far as the pituitary tropic hormones are concerned. Thus Spence and Witts (1938) found that patients soon became resistant to the thyrotropic hormone, and were able to demonstrate the presence of the antithyrotropic hormone in their serum. It seems generally advisable also to give the growth hormone periodically with intervals of rest, in order to avoid the development of the antihormone.

6. *Employed Empirically.*—As time goes on we may expect to find instances originally placed in this category

transferred to others. Indeed, this process is actually in progress. Thus while I can offer no rational basis for the relief given by pitressin for the pain of herpes zoster and its frequent neuralgic sequel (W. H. Marshall, in a private communication), the influence of parathormone on intestinal colic may perhaps be explained by the sedative effect of hypercalcaemia on muscular tone. The rationale of the treatment of chronic mastitis by oestrin with or without the addition of prolactin is not yet obvious, since both these hormones increase the activity of the breasts. The relation between oestrin and the condition of the nasal mucosa is, however, of special interest. In animals the olfactory sense is clearly associated with sex, and the observations of Mortimer, Wright, and Collip (1937) on the effect of oestrin in the treatment of atrophic rhinitis are important. This has led A. S. Hoseason (*Journal*, October 1, p. 703) to call attention to the opposite condition of vasomotor rhinitis, and compare it with the condition produced experimentally in monkeys by overdosage with oestrin.

I do not, however, intend to say much about organotherapy by sex hormones, because, this being at the moment the most rapidly advancing branch of endocrinology, some of the subsequent speakers will devote the whole of their contributions to it. I would, nevertheless, point out that the increasing use of oestrogenic substances in the treatment of disorders in the male supports Dodds's conception of the "skeleton key" action of certain hormones.

Deleterious Effects

That self-medication by thyroid extract often leads to disastrous effects is generally recognized. Any really active therapeutic agent is capable of misuse. The danger of repeatedly inducing insulin hypoglycaemia has already been referred to. Parathormone can clearly have a destructive effect upon bone and may induce the formation of renal calculi; fortunately these effects are partially limited by its exciting the production of an antihormone. The administration of oestrin for the vulvovaginitis of children has been followed by precocious puberty, both physically and psychically. Dodds and Noble (1937) have demonstrated the harmful effect of repeated injections of pituitrin on the gastric mucosa. Whether continued injections of adrenaline can produce arteriosclerosis has been much disputed. On the whole it seems unlikely. I saw one striking case under the care of Dr. George Graham where a young woman developed a systolic blood pressure of 280 mm. Hg after frequent injections extending over two years, but in view of the rarity of such a sequence she may have had a coincident malignant hypertension. I think the experimental evidence as to the carcinogenetic effect of oestrin need not lead us to fear a clinical counterpart; it has been calculated that it would take fifty years for its ordinary administration to have this effect in human beings.

Routes of Administration

(*a*) *Oral.*—The early triumphs of thyroid medication by this route led to disappointment when it was found that it was not equally effective for other hormones. There seems to be a good case for the efficacy of this method for certain sex hormones, though about five times as large a dose is required compared with injection. Haemopoietin and ventriculin may fairly be regarded as hormones, and are undoubtedly effective given thus. As to certain properties of anterior pituitary, I must confess that *pace* the pharmacologists I have seen effects follow its oral administration too frequently to believe they were merely due to coincidence. But here I expect I am in a minority.

(*b*) *Nasal.*—As the post-pituitary is an upgrowth from the nasal mucosa, it was suggested by Blumgart that this route might be effective for pituitrin, and so it proved to be. It remains true, however, that the

(*c*) *Subcutaneous* is the only effective route for the majority of hormones, reinforced by

(*d*) *Intravenous* administration in emergencies such as diabetic coma.

(*e*) *Rectal* administration is seldom called for, and though advocated for insulin it offers quite as great drawbacks as the hypodermic syringe.

(*f*) *Cutaneous.*—B. Zondek (1938) has called attention to the fact that the oestrogenic hormone dissolved in benzol, ether, or alcohol is completely absorbed by the skin.

Receptivity of Hormones by the Tissues

Although intensive study has been made of the pharmacology of hormones, there is evidently another aspect which has so far been little investigated. That is the receptivity of the tissues. How this normally varies in accordance with the needs of the body can be succinctly illustrated by the metamorphosing tadpole. Under the influence of thyroxine the cells of the gill-covers atrophy, while at the same time the limb-buds grow actively. This may perhaps be regarded simply as an example of thyroxine speeding up metabolism in the direction in which it is normally going, but other instances cannot be so simply explained.

Some thirty years ago Langley and Elliott independently postulated the existence of a receptive substance between the nerve-ending and the tissue as necessary to explain the facts then known. If such a postulate was required then, how much more is it needed to-day! Just as the appropriate chemical material, such as pilocarpine or atropine, may get into this receptive substance, so may a toxin. G. N. Myers has shown that a therapeutic drug may seize on the receptive substance and thus bar the way to the ingress of the toxin. It seems to me that the pharmacology of the future will have to concern itself with the natural history of these receptive substances, and find out in what manner they can be helped by drugs, both positively, by facilitating their reactions, and negatively, by blocking the way against the entrance of toxins. Nor is this topic remote from my subject, for H. Zondek (1935b) maintains that the absorption of a hormone, such as thyroxine, is decreased in the presence of narcotics such as the barbiturates, which are able to adhere to the cell surface and thus to displace the hormone from it. But it is also germane to my subject in a wider sense. We are still entirely without any conception why a particular cell should be sensitive to a particular chemical substance or why the same substance should augment the activity of one type of cell and inhibit that of another. The nature of these receptive substances is a problem to which many minds are beginning to devote themselves. The importance of the responsive capacity of the receptor tissues was clearly indicated by Harrison in his Harveian Lectures for 1934. He showed that when transplantation is effected between embryos of species of different sizes the transplant responds according to its inherited growth capacity rather than to its new endocrine environment. As Keith pointed out some years ago, the partial gigantisms in certain cases of hyperpituitarism can only be explained

on the theory that the locally hypertrophied tissues had developed a special sensitiveness to the growth hormone. H. M. Evans has shown that the response of the dachshund and of the sheep-dog to injections of the pituitary growth hormone is entirely different. Indeed, if such things were not so, it would be difficult to account for structural plasticity in the hands of the breeder.

It must have fallen to the lot of everyone who has treated cases of pituitary obesity to find some patients entirely refractory to treatment identical with that which has been successful with others. Yet clinically no difference could be detected between the two groups. I know that there are authorities who maintain that obesity can always be reduced by diet alone; I do not know if they would add that the patient can also be kept in good health. I believe that retention of water is one factor in preventing reduction of weight, and I sometimes speculate on the possibility of putting on weight by assimilation of oxygen: how otherwise does the hibernating animal become heavier? But apart from such controversial matters, it seems clear that cases of obesity of admittedly endocrine origin respond so differently that some difference of receptivity is probable.

In concluding this necessarily summary introduction to the discussion may I express the hope that research on the synthetic hormones may effect two things: first, the discovery of simple basal groups which can produce the biological effect and yet escape disintegration by the digestive juices; and, secondly, reduce materially the cost of production. At present the cost of many is prohibitive except for the very rich and for the hospital class.

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L. Rizzi (*Riforma med.*, 1938, **54**, 1222), who records an illustrative case, states that in most of the cases of pituitary haemorrhages on record there are minute punctate haemorrhages indicating toxic degeneration, or merely sudden increase of pressure, corresponding to the small haemorrhages observed in all the other organs. Large pituitary haemorrhages are very rare, and their origin is obscure. Almost all cases of this kind have shown old haemorrhages, which had given rise to more or less definite pituitary syndromes. The present case was that of a woman, aged 49, the subject of diffuse glomerular nephritis with hypertension, who six days before death developed severe cerebral symptoms due to uraemia. In addition to well-marked arteriosclerosis and renal sclerosis the necropsy showed a large haemorrhagic cyst in the hypophysis. The cause of death in this case was the compression of the mid-brain or the general endocranial hypertension produced by the haemorrhage.

TREATMENT OF TUBERCULOSIS IN GUINEA-PIGS WITH SULPHANILAMIDE

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The experiments described in this paper were carried out in an attempt to repeat the work of Rich and Follis (1938), who obtained considerable inhibition of the development of tuberculous lesions in guinea-pigs infected with a human strain.

Technique

Infection of Guinea-pigs.—Suspensions of actively growing (six-day) cultures from Petragnani's medium were injected subcutaneously into the right leg of guinea-pigs which averaged 400 grammes in weight. Two virulent strains were used, as follows:

Human strain, R. 2: Twenty guinea-pigs received 0.05 mg. of culture and twenty 0.5 mg.

Bovine strain, BV. 28: Twenty guinea-pigs received 0.01 mg. and twenty 0.1 mg.

With the aid of an opacity standard tube we estimated that 1 mg. of culture contained approximately 2,000 million tubercle bacilli.

Treatment with Sulphanilamide.—Half the animals in each group were kept as controls and half were given sulphanilamide (50 per cent. suspension in 5 per cent. gum arabic) four times daily by mouth. A total of 500 mg. (100 mg. at 9 a.m., 1.30 p.m., and 5 p.m., and 200 mg. at 10 p.m.) was given daily for five days; these doses were halved from the sixth to the forty-second day, when all survivors in both treated and control groups were killed. Unlike Rich and Follis, who deposited the drug in the cheek pouch, we induced the swallowing reflex by ejecting the suspension from a syringe on to the back of the tongue and pharynx. Almost all the material thus administered was retained.

Toxic Effects of Sulphanilamide

The treatment we employed for the first five days of the experiment—namely, 500 mg. daily—was regarded as the optimum therapeutic dosage by Rich and Follis, who noted evidence of overdosage, however, in certain guinea-pigs which had been treated for three to six weeks. We reduced the dosage to 250 mg. after the fifth day, because some guinea-pigs undergoing treatment soon became ill with characteristic toxic signs—loss of weight and temporary paralysis.

The average weights of the treated and control groups of guinea-pigs were approximately the same (400 grammes) at the beginning of the experiment, but the treated animals lost an average of 50 grammes during the first week of treatment, whereas the weights of the untreated controls remained stationary. When dosage was reduced towards the end of the first week the general condition of the treated animals improved, although they remained lighter than the untreated controls. Unfortunately, in this preliminary experiment we did not continue to weigh the animals at weekly intervals.

Therapeutic Results

Sulphanilamide did not completely arrest the development of generalized tuberculosis. The lesions of the treated animals that died during the fourth or fifth week of the experiment appeared to be less than those of controls. All the survivors were killed on the forty-second day, when the differences between the groups were as follows:

HUMAN STRAIN, R. 2

The spleens of the control animals were very friable, but those of the treated animals were of almost normal texture. Although macroscopic tuberculous foci were present in the spleens of all the guinea-pigs, they were fewer, much smaller, and showed less tendency to coalesce in the treated group. Spleens from nine controls and nine treated animals were sectioned by Dr. C. L. Oakley, who reported that "tubercles were present in all, but were consistently smaller and showed less tendency to coalesce in the treated animals than in the controls. In many spleens from control animals no normal splenic tissue could be found; in most of the treated animals each tubercle was surrounded by a broad zone of more or less normal spleen. In no instance was there the slightest sign of healing."

In the third series of experiments of Rich and Follis no animals in the fifth week and only one of six animals in the sixth week in the treated group showed macroscopic lesions in the spleen, although all except one showed scattered microscopic tubercles. This is a better result than we were able to obtain in our preliminary experiment.

The spleens of our treated animals (average area of anterior surfaces, 460 sq. mm.) were less enlarged than those of the untreated controls (average, 822 sq. mm.), but this difference was probably partly due to the fall in weight of those treated. Our colleague, Dr. J. W. Trevan, kindly examined the data statistically, and concluded that the size of the spleen did not provide any important evidence as to the intensity of infection.

Many tuberculous foci were present in the lungs of both our treated and untreated animals, but they were somewhat fewer and more discrete in the former group, and had less associated basal consolidation. The inguinal and tracheobronchial lymphatic glands were much smaller and not so caseous in treated guinea-pigs.

The livers of many animals showed macroscopic lesions, and the variation in the extent of the infection in the treated and control groups was slight. There were no significant differences in the amounts of pus in the local lesions at the site of inoculation.

BOVINE STRAIN, BV. 28

Treatment had possibly a slight inhibitory effect in guinea-pigs—less than was obtained in the experiment with the less virulent human strain, R. 2.

A companion experiment in rabbits showed no evidence of inhibition of tuberculosis with treatment. Eight control and eight treated animals were used, 3,750 mg. of the drug being administered daily to each treated rabbit in divided dosage.

Summary and Conclusions

Sulphanilamide appears to produce some degree of inhibition of an infection of guinea-pigs with a human strain of the tubercle bacillus. Our results are less striking than those of Rich and Follis—possibly due to a difference in strain.

The drug had very little influence on the course of infection in guinea-pigs and none in rabbits when a bovine strain was used.

We agree with Rich and Follis that it would be regrettable if any premature and unjustifiable conclusions were drawn regarding the treatment of tuberculosis. Further prolonged investigations with sulphanilamide and other preparations are clearly necessary under carefully controlled conditions, special attention being paid to the toxicity of the drugs employed.

We are indebted to Dr. A. Stanley Griffith for the virulent bovine strain, BV. 28, and to Drs. J. W. Trevan and C. L. Oakley for their valuable help.

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THE SARCOIDOSIS OF BOECK

BY

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(WITH SPECIAL PLATE)

The individual lesions of sarcoidosis have been recognized for many years, but, as patients would seek the advice of the dermatologist for one, the general physician for another, and the ophthalmologist for a third, the synthesis which showed them all to be expressions of the same morbid process was long delayed. However, the concept of a generalized disease with infiltrations of the skin in only a moiety of the cases is now widely admitted. Jonathan Hutchinson (1875) was the first to recognize the complaint, although priority is usually given to other workers—Besnier (1889), Tenneson (1892), and Boeck (1899). He "was accustomed . . . to designate the condition Mabey's malady"—from the name of his patient—"and although other and more scientific names might be devised, it is perhaps doubtful whether they would be more convenient" (1900). Longcope and Pierson (1937) quote nine other synonyms, and their list is by no means exhaustive. In the present paper the term "sarcoidosis of Boeck" is used, not for its intrinsic merit, which is little, but because it is familiar and bears no causative connotation.

The sarcoidosis of Boeck is a disease of long duration with a tendency to spontaneous remission; it is characterized by enlargement of lymph-nodes and spleen, by infiltrations of the skin, lungs, and bones of the fingers, by enlargement of parotid and lacrimal glands, and by iridocyclitis. One or more of these changes may be present in any individual case. It is my purpose to describe the clinical picture of the disease and to present very briefly eight new cases.

Sarcoidosis is not a rare disease, but it is difficult to give its frequency numerical expression as the patients are scattered through the special departments of a hospital. In over 300 histological examinations of lymph-nodes excised to establish a diagnosis of Hodgkin's disease, sarcoidosis was found once to every eleven cases of lymphadenoma; when to these are added the patients who attend the dermatologist for cutaneous sarcoid and some cases of "tuberculous" iridocyclitis from the ophthalmologist, it will be appreciated that its frequency demands for it a wider recognition. The eight cases reported here were collected in less than a year.

The Clinical Picture

The course of the disease is one of extreme chronicity unaccompanied in the majority by such symptoms of intoxication as pyrexia or emaciation, although there may be complaint of tiredness. The patient commonly comes

under observation on account of enlargement of lymph-nodes, or, if some other manifestation provides the first symptom, lymphadenopathy is found. The initial complaints in the present cases are tabulated below:

Lymphadenopathy	2	Swelling in breast	1
Cutaneous lesions	2	Swelling of parotid and lacrimal glands	1
Cough	1	Swelling of fingers.. ..	1
Tiredness	2		

Gradually other lesions appear while the earlier ones involute, and this process may continue over a number of years, tending often towards complete recovery.

Lymphadenopathy and Splenomegaly

Enlargement of superficial lymph-nodes is present at some stage in all cases; it is usually generalized and of moderate degree, but on occasions it is limited to one group of nodes and is of such an order as to raise the suspicion of Hodgkin's disease. The enlarged nodes are painless and insensitive, discrete and mobile; while the patient is under observation they may retrogress and become impalpable. Splenomegaly is common and may sometimes be considerable. The spleen was palpable in five of the present cases. It is probable that some of the cases reported as tuberculous splenomegaly with miliary tuberculosis of the lungs (Hickling, 1938) are instances of sarcoidosis.

Cutaneous Lesions

The infiltrations of the skin are often so bizarre that they have attracted much attention in the past, and in consequence sarcoidosis was for years regarded as a disease of the skin with occasional visceral manifestations. The frequency of these lesions is difficult to compute, but it is probable that they are found in not more than 50 per cent. of all cases of sarcoidosis; clinically the cutaneous lesions fall into four groups:

1. *Miliary Lupoid* (Boeck, 1899, 1905).—This occurs in two forms: first as an eruption of small red-brown papules affecting the cheeks, forehead, extensor surfaces of the arms, the buttocks, and the back of the legs. The papules are usually smooth, but may show hyperkeratosis. This fine form of miliary lupoid occasionally occurs in plaques resembling lichen planus (lichenoid variety). The second form is the nodular sarcoid where lesions occur most frequently on the face and limbs. The nodules during the stage of eruption may reach a diameter of 5 cm.; they are smooth, slightly elevated, and red-blue in colour; in the florid stage, which may last twenty years, they increase in volume, become violaceous, and the surface, which never ulcerates, is often telangiectatic. The whole process is one of extreme torpidity. In the stage of involution, central flattening gives rise to an annular appearance, and telangiectasis and pigmentation of the margins are common.

2. *Lupus Pernio* (Besnier, 1889; Tenneson, 1892).—This is a diffuse infiltrative lesion affecting the nose, cheeks, and sometimes the lobes of the ears. The eruption has a sharp border with a surface which may appear almost burnished. Perniotic lesions of the fingers with associated bone changes are common.

3. *Angio-Lupoid* (Brocq and Pautrier, 1913).—This lesion is less common. It occurs in women of middle age, and consists of soft infiltrated plaques on the sides of the root of the nose, violet-red in colour with marked telangiectasis.

4. *Érythrodermie Sarcoïdique* (Schaumann, 1924) appears as large superficial serpiginous red areas on the front of the legs and thighs.

An isolated lesion of the skin, especially of the types described as miliary lupoid and angio-lupoid, is not always sufficient for a diagnosis of sarcoidosis, as cutaneous infiltrations which are macroscopically and microscopically identical may be due to other causes. These causes are leprosy (tuberculoid type; Motta, 1931), leishmaniasis ("bouton d'orient"; Dupont, 1930), and possibly tuberculosis and syphilis. Of the cases reported here four had skin eruptions at one time or another. Case I showed the coarse nodular sarcoid, Cases III and VII the fine miliary lupoid, and Case VIII was an example of lupus pernio.

Pulmonary Lesions

The intrathoracic changes are of two types: first and most common is the enlargement of mediastinal or hilar lymph-nodes, which may be sufficient to simulate Hodgkin's disease, although in sarcoidosis the hilar lymphadenopathy predominates, while in lymphadenoma the form is more commonly mediastinal. The second type of lesion is seen radiographically as a diffuse mottling throughout the lung fields, simulating that of miliary tuberculosis but usually coarser and less regularly disposed. There is evidence to show that this miliary lesion may result in pulmonary fibrosis and even produce heart failure. Five of the present cases showed hilar or mediastinal lymphadenopathy, and one the miliary change. It is remarkable that these extensive radiographic abnormalities are accompanied by so few symptoms and physical signs; cough was a feature of two cases, but there were no sputa, and the physical signs were limited to basal crepitation. It seems possible, as Bödecker (1932) has suggested, that some of the cases reported as chronic miliary pulmonary tuberculosis may be examples of this disease. (Plate, Figs. 1, 2, and 3.)

Bones

The changes occur almost exclusively in the phalanges of the hands and feet. Clinically they make their appearance as painful fusiform swellings of the fingers. The radiographic changes were fully described by Jüngling (1920) as osteitis multiplex cystica vel cystoides tuberculosa, although they had been recognized eighteen years previously by Kienbock (1902) and their association with lupus pernio noted by Kreibech (1904). The normal structure of the phalanx is replaced by a lace-like network with small areas of rarefaction often surrounded by a zone of increased density. On occasion these radiographic changes are unaccompanied by clinical evidence of disease, but the process may advance to cause mutilation or may heal so completely that the finger appears normal except for some deformity of the nail. Osteitis multiplex occurred in two of the present series (Fig. 4).

Other Lesions

Enlargement of the parotid and lacrimal glands has often been noted; in this series the parotid glands were enlarged in one, and the lacrimal glands in one, and both parotid and lacrimal glands in a third case. This patient presented the clinical picture of Mikulicz's syndrome. Three of Longcope and Pierson's cases showed affections of one or other of these glands.

Iridocyclitis is stated to occur in about 10 per cent. of cases of sarcoidosis (Blegvad, 1931); it is of the type described as "tuberculous" or "paratuberculous." This affection is often resistant to treatment, and may lead to blindness, as in one of the two cases affected in this series. Other ocular lesions are uncommon, but Blegvad (1931) has reported infiltration of the conjunctiva.

Several writers have suggested that the uveo-parotid syndrome of Heerfordt (1909) is inseparable from sarcoidosis; the histological changes are identical, and a perusal of case reports shows that all gradations, from iridocyclitis with swelling of the parotid glands to the well-known clinical picture of miliary lupoid, occur. Pautrier (1938) and Slot, Goedbloed, and Goslings (1938) have reported cases which show clearly that uveo-parotitis must be regarded as a clinical variant of sarcoidosis.

Infiltrations in many other sites have been recorded, but those already described occur often enough to constitute an easily recognizable picture. Boeck (1916) and Mylius (1928) have stressed the frequency of lesions in the mucosae of the upper air passages; the breast was involved in one of the present cases and in one seen by Goeckermann (1928). There are records of lesions in the testicle (Pautrier, 1935), the hypophysis (Schaumann, 1936), and the optic nerve (Reis and Rothfeld, 1931).

Treatment

It is difficult to evaluate the results of treatment in a disease which so often shows spontaneous involution. Radiotherapy, gold, arsenic, and tuberculin are generally held to be useless, although improvement followed the first two in some of the present cases. Lomholt (1937) has reported benefit from antileprol.

Pathology

The observation that a negative Mantoux reaction is common in sarcoidosis has given rise to much speculation. It has been urged that it is an instance of cutaneous "anergy" (Martenstein, 1924), but it has never been established that the reaction is negative more frequently than in a series of normal controls, and Kissmeyer (1932) concludes that the percentage of negative reactions is what would be expected in non-tuberculous subjects of the same age. The proportion of negative tests in different series varies considerably.

Anaemia is mild or absent, and examination of the blood often reveals a moderate mononucleosis; two of the present cases showed an eosinophilia such as was noted by Longcope and Pierson (1937). An increase in the plasma globulin has been observed by Salvesen (1935), and was present in one of my patients.

The histological changes are identical in all the affected tissues. There is a proliferation of histiocytes to form discrete collections of epithelioid cells, among which an occasional giant cell may be seen. Surrounding lymphocytic infiltration is lacking; there is no caseation, and tubercle bacilli cannot be demonstrated. The lesions may be said to consist of "pathological tubercles," and the changes are familiar to all morbid anatomists under the name of hyperplastic or endothelial "tuberculosis," although a more accurate descriptive term would be histiocytic sinus reticulosis (Fig. 5).

Aetiology

An acrimonious dispute over the nature of sarcoidosis has been in progress for many years. Three hypotheses have been adduced: first, that it is due to tuberculosis; secondly, that it is a non-specific tissue response which may be evoked by a variety of pathogenic agents such as the tubercle and lepra bacilli, the *Spirochaeta pallida*, and leishmania; and, thirdly, that it is a systematized disease of lympho-reticular (reticulo-endothelial) tissue comparable to Hodgkin's disease and similarly of unknown aetiology. The first hypothesis has been favoured by dermatological opinion; but inoculation experiments, with a few doubtful exceptions, have been consistently negative, and acid-fast bacilli have been demonstrated only in a handful of cases, all of which Kissmeyer (1932) has shown to be open to criticism. The only facts favouring a tuberculous aetiology are the microscopical appearances, and the observations of Schaumann (1923) and others that some patients have died of phthisis. Most pathologists will admit that the histological signature of the tubercle bacillus is susceptible of forgery, and phthisis may clearly be a secondary infection in an occasional case; indeed, it is possible that the pulmonary fibrosis which sometimes occurs may be a predisposing factor. The second hypothesis also has its origin in dermatological writings, and, although it must be admitted that similar cutaneous lesions may be due to Hansen's bacillus (tuberculoid leprosy) or leishmaniasis (Dupont, 1930), it is unbelievable that the whole characteristic and well-defined syndrome of sarcoidosis could be anything but a specific disease due to one cause. The suggestion that sarcoidosis falls into the same category as leucosis and Hodgkin's disease and must rank as a reticulosis (Pullinger, 1932; Ross, 1933; Bodley Scott and Robb-Smith; 1936) is finding increasing favour, although its cause remains as obscure as that of the other diseases of this group.

Case Reports

CASE 1

A married woman, this patient came of healthy stock, and had had no illness, except catarrhal jaundice in childhood, until the age of 34 years, when she noticed an eruption above the right eyebrow. Ten months later similar spots appeared on the arms, knees, and neck; she began to tire easily and sweat at night, but there was no loss of weight. On admission to hospital at the age of 35 she was apyrexial and weighed 45 kg. The cutaneous lesions consisted of slightly raised infiltrated areas, oval or circular in shape, and in colour varying from violaceous to yellow-red. All the superficial lymph-nodes were enlarged and of an average diameter of 1 cm. The spleen extended 5 cm. below the left costal margin. A blood count showed a hypochromic anaemia with 58 per cent. haemoglobin and a normal differential count. A skiagram of the chest showed some enlargement of mediastinal nodes, and although the hands appeared normal the radiographic lesions of osteitis multiplex were found in the left middle finger. The Wassermann and Mantoux tests (0.1 mg. O.T.) were negative, and biopsy of a cutaneous nodule showed the histological changes of sarcoidosis. She was treated with ultra-violet light and discharged.

Six months later she was readmitted. The eruption was unchanged, her weight was steady, and lymphadenopathy persisted only in the posterior cervical triangles. The spleen and liver were palpable; the anaemia had been remedied and the differential leucocyte count remained normal. She was discharged after a fortnight, and two and a half years later her condition was the same although her general health remained unimpaired.

At the age of 39 an attack of iridocyclitis, from which she made a complete recovery, was treated at an ophthalmic hospital. During the next six years she improved considerably with injections of sodium morrhuate, but developed a morning cough with sputum. In her forty-fourth, forty-fifth, and forty-sixth winters she had attacks of "pneumonia." At the age of 48 she was still troubled with morning cough and dyspnoea on exertion. Her weight was 45 kg. The eruption had disappeared from the face, but persisted on the arms and back in the form of erythematous areas without infiltration but with an occasional yellow-brown nodule. Shotty lymph-nodes were palpable in the neck, axillae, and groins, and the spleen extended 12 cm. below the costal margin. Crepitation was audible at the base of both lungs. The hands and feet were clinically and radiographically normal, but skiagrams of the chest showed a diffuse fibrosis of both lungs (Fig. 3).

CASE II

In this case, that of a West Indian male native, who was first seen at the age of 18 years on account of palpitations, no cardiovascular disease could be found, but there was enlargement of lymph-nodes in the neck and epitrochlear regions, and the spleen was easily palpable. His weight was 60 kg. The patient's health remained good until the age of 19½ years, when for a few weeks he noted dyspnoea on exertion; his spleen was again found to be enlarged. He was free from symptoms until the age of 28, when he developed a feverish cold, followed a week later by painful swelling of both lacrimal glands The swellings subsided after a few days and a dry paroxysmal cough appeared. Three months later he began to tire easily; his temperature rose occasionally to 99.5° F. and there was some dyspnoea. He had recurrent sore throat, and his left antrum was thought to be infected, but puncture led to no improvement.

He was admitted to hospital, then being 29 years old. His weight was 79 kg.; he was apyrexial, and his pulse frequency varied from 90 to 110 per minute. There were enlarged lymph-nodes in the upper deep cervical groups and in both groins; they were discrete, firm, mobile, and of an average diameter of 1.5 cm. A few crepitations were heard at the base of both lungs. A skiagram of the chest showed great enlargement of the hilar nodes, particularly on the right. The sputum contained no tubercle bacilli. Blood count: erythrocytes, 5,240,000 per c.mm.; haemoglobin, 90 per cent.; colour index, 0.86; leucocytes, 7,700 per c.mm.; neutrophils, 60 per cent.; eosinophils, 9 per cent.; lymphocytes, 7 per cent.; plasma cells, 1 per cent.; monocytes, 14 per cent. Biopsy of a node revealed the changes of sarcoidosis, and the Wassermann reaction was negative.

He was discharged to a sanatorium, and there was a slow improvement in his condition in the next two years.

CASE III

This patient, a married woman with three healthy children, came from a healthy family and had always been well herself, although for as long as she could remember there had been "enlarged glands" in the left side of the neck. When 38 years old she noticed a painless swelling in the right breast, for which she sought admission to hospital. There were small discrete lymph-nodes palpable in the left side of the neck, and in the right breast was a hard mobile well-defined swelling measuring 5 cm. by 4 cm. On excision this was found to have the histological structure of sarcoid tissue, and a lymph-node showed similar changes. At this time she began to be troubled by pain in the left eye, and a year later the right one became similarly affected. At the age of 40½ she was readmitted: enlarged nodes were still present in the left side of the neck, and there was a swelling in the left parotid gland and paresis of the left facial nerve. The eyes showed bilateral iridocyclitis with secondary cataracts, and only perception of light was present. Lymph-nodes removed from the left side of the neck showed sarcoidosis. A radiograph of the chest was normal. Left iridectomy was performed with some improvement, and a year later a similar operation was carried out on the right eye.

At the age of 42 she was blind, apart from perception of light in the left eye; enlarged nodes were palpable on both sides of the neck, and she showed the classical features of myxoedema. On the abdominal wall was one small patch of miliary lupoid. The blood picture was normal and skiagrams of the chest showed a fine diffuse fibrosis; no radiographic changes were found in the hands. With thyroid therapy her general health improved, and apart from her blindness she began to feel well.

CASE IV

This patient came of a healthy long-lived family, although his father, who died after an operation for urethral stricture, was said to have contracted syphilis before marriage. In infancy he had had scarlet fever, mumps, and chicken-pox, but was in good health until the age of 13½ years, when he began to feel tired at the end of the day. At this time both eyelids and both parotid glands became swollen, there was some pyrexia, and he lost weight. After three months he was admitted to a sanatorium, where he improved and gained weight: the report stated that "no signs of tuberculosis were found." Two months later he was transferred to St. Bartholomew's Hospital; he had been in bed for the previous six weeks, but felt well and was gaining weight; there was no cough. His weight was 43 kg.; he was apyrexial, but had a tachycardia of about 100 per minute. Both parotid and both lacrimal glands were enlarged, and there was oedema of the upper lids. The tonsils were fleshy, and shotty lymph-nodes were palpable in both upper deep cervical and inguinal groups. The liver extended 4 cm. below the costal margin, and the tip of the spleen was palpable. A skiagram of the chest showed massive enlargement of hilar and mediastinal nodes. Blood count: erythrocytes, 4,970,000 per c.mm.; haemoglobin, 78 per cent.; colour index, 0.8; leucocytes, 9,600 per c.mm.; neutrophils 58 per cent.; eosinophils, 5 per cent.; lymphocytes, 29 per cent.; monocytes, 7 per cent. Mantoux test (1 mg. O.T.), weak positive. The Wassermann reaction was negative. He was discharged from hospital and spent the subsequent year in Switzerland.

The patient continued to gain weight and to feel well. He was readmitted when 17 years old, and a node which showed the changes of sarcoidosis was removed from the groin (Fig. 5). At that time only the inguinal nodes were palpable; other physical findings were negative, but a skiagram of the chest showed little change from that of two and a half years previously.

CASE V

The patient came of healthy stock and had always been well, except for scarlet fever and mumps in childhood. At the age of 21 she married and subsequently had three pregnancies, all of which terminated in abortion. When 23½ years old red lumps appeared on the skin, following an attack of rheumatism; these faded after a fortnight. Six months later she developed a cough with yellow sputum; there was no sweating and no haemoptysis, but she lost 2 kg. in weight in a month. After six weeks she was admitted to hospital: her weight was then 47 kg.; her temperature occasionally reached 99° F. at night, but there was no tachycardia. Enlarged lymph-nodes were palpable in both sides of the neck and in both groins; none exceeded 1 cm. in diameter. There was flattening and reduced movement over the upper part of the right lung. Examination of the blood showed a haemoglobin of 75 per cent. and a lymphocytosis of 47 per cent. of 7,600 leucocytes per c.mm. The sputum contained no tubercle bacilli; the Mantoux test (0.1 mg. O.T.) and the Wassermann reaction were negative. A skiagram of the chest showed a shadow extending from the mediastinum into the right lung field, with a diffuse mottling of the right upper zone (Fig. 1); there was no radiographic abnormality of the hands. An excised node was histologically typical of sarcoidosis. The patient contracted measles while in the ward and was transferred to a fever hospital. On her return after four weeks the nodes in her neck had decreased in size, but those in the epitrochlear regions were palpable, as were some in the right costo-coracoid group. The tip of the spleen could be felt. Treatment with intravenous crisalbine was instituted, and she was discharged improved after a month. She received continued treatment as an out-patient, and a year later her weight had risen to 57 kg., her general health was excellent, a few small nodes were still palpable, and the mediastinal mass had almost vanished.

CASE VI

A married woman aged 21, who had always been healthy and came of sound stock, this patient had an eruption of painful red swellings on both legs which disappeared after a fortnight. About the same time she noticed a swelling in the right side of the neck; she began to lose strength, was listless, and sweated at night. Her condition remained unchanged until six months later, when swellings appeared under the chin and in the left side of the neck. These

increased steadily in size. She had no cough, but had lost weight. At the age of 22 she was admitted to hospital; she weighed 62 kg. and was apyrexial. All superficial lymph-nodes were enlarged; the tip of the spleen was palpable and occasional rhonchi were audible in the chest. She had a moderate anaemia with 78 per cent. haemoglobin, but the blood count was otherwise normal. The Mantoux test (0.1 mg. O.T.) and the Wassermann reaction were negative. A skiagram of the chest showed mediastinal glandular enlargement. An excised cervical node had the microscopical appearance of sarcoidosis. After radiotherapy she was discharged from hospital; the nodes were then considerably smaller, but she had lost 4 kg. in weight.

Six months later there was further diminution in the size of the lymph-nodes, and after another three months only those in the axillae remained palpable. At this time a skiagram of the hands showed no bony lesion, but in the lungs a miliary type of infiltration (Fig. 2) had been added to the mediastinal lymphadenopathy. Her general health was good; she had regained 3 kg., but still complained of some tiredness at the end of the day. A year after her discharge from hospital her weight was 66 kg., she was free from symptoms, no superficial nodes were palpable, and the radiographic appearance of the lungs was normal.

CASE VII

This girl was one of a healthy family and had always been well herself, apart from childish ailments, until the age of 14½ years, when she noticed a small pimple on the right cheek. Six months later a painless swelling appeared in the right side of the neck, increasing slowly in size. At 16 years of age a similar lesion appeared on the left arm; a diagnosis of lupus vulgaris was made, and she was treated with injections and ultra-violet light. She lost no weight, had no fever and no sweats, and her general health was unimpaired. A year later she was admitted to hospital; she was apyrexial and without tachycardia, and her weight was 56.5 kg. Small patches of typical miliary lupoid were present on the cheeks, arms, and back. There were enlarged lymph-nodes in both sides of the neck, the greatest measuring 2 cm. by 3 cm.; small nodes were palpable in both axillae and groins. The blood picture was normal; the Mantoux test (0.1 mg. O.T.) and the Wassermann reaction were negative. She was discharged after a stay of eleven days. Eight months later she was readmitted; her weight had increased by 4 kg., but her condition was otherwise unchanged. Skiagrams of the chest and hands were normal, and after a course of radiotherapy the lymph-nodes became smaller.

CASE VIII

A missionary worker whose father died of pulmonary tuberculosis, this patient had herself been healthy, apart from acute appendicitis, until the age of 28, when she had sudden pain and swelling in the fourth left digit. The swelling gradually involved the whole finger, and later the left thumb and index were affected. After a few months the hand became almost normal again. At the age of 42 a red eruption appeared on the right side of the face and slowly spread over the nose and left side of the face. Six years later there was swelling of the lymph-nodes in the left side of the neck which subsided after about six months.

She was admitted to hospital when 55 years old. There was some dyspnoea on exertion, but no cough, no loss of weight, and no fever. A typical eruption of lupus pernio affected both cheeks and the nose; shotty lymph-nodes were palpable in both posterior triangles, and a persistent rale was audible at the base of both lungs. There was a fusiform swelling of the proximal phalanx of the left fourth digit, and the terminal phalanx was hyperextended. The blood picture was normal; the Mantoux test (0.1 mg. O.T.) and the Wassermann reaction were negative. Serum proteins: albumin 5.2 grammes and globulin 5.2 grammes per 100 ml. Skiagrams of the chest revealed some fibrosis involving particularly the right lower lobe, and the hands showed the radiographic changes of osteitis multiplex in the first and fourth left digits (Fig. 4).

She was treated with solganol-B-oleosum intramuscularly, and after seven months her health remained good, while the local lesions were unchanged.

Conclusions

1. Sarcoidosis is a systematized disease of lympho-reticular (reticulo-endothelial) tissue in which changes are found particularly in the lymph-nodes, spleen, skin, bones of the hands, lungs, eyes, and salivary glands.

2. The uveo-parotid syndrome of Heerfordt is a clinical variant of sarcoidosis.

3. Its course is prolonged and benign, and it has a tendency towards spontaneous recovery.

4. There is no convincing evidence that sarcoidosis is a manifestation of tuberculosis.

5. It is of common enough occurrence to be a disease of interest to all general physicians.

6. Eight new cases of sarcoidosis are reported.

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E. H. J. Warns (*Nederl. Tijd. Geneesk.*, 1938, **82**, 4426) treated twenty-six patients with osteo-articular tuberculosis by large doses of vitamin C for four and a half months, but without any therapeutic effect except possibly a slight improvement in the general condition. On the other hand, the frequently reported deficiency of vitamin C in tuberculosis was confirmed: its daily consumption by the patients was three to five times the normal. There also appeared to be a certain relation between the daily consumption of vitamin C and the activity of the tuberculous process.

FURTHER EXPERIENCES WITH TOMOGRAPHY IN PULMONARY TUBERCULOSIS

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(WITH SPECIAL PLATE)

The theory of tomography, and the principles governing this method of taking *x*-ray pictures of a section of an organ, have been described in several papers (McDougall, 1936, 1937; McDougall and Crawford, 1937), and the present position has been well summarized in a leading article in the *British Medical Journal* (1937). The value of tomography in cases of pulmonary disease is now fully recognized, and with the elaboration and perfection of relatively simple apparatus this method of investigation is likely to enjoy an increasing popularity.

Technique of Tomography

We have continued to use the Sanitas machine as devised by Grossmann (1935), and since March, 1936, when we first began to use tomography at Preston Hall, nearly 400 patients have been investigated by this method. Grossmann's tomograph has been criticized as expensive, but the quality of the pictures is excellent, and post-mortem confirmation of the appearances of the lesion at different sections has been obtained; these afford complete proof of the general accuracy of the apparatus. Furthermore, the resultant films seem to us to present a greater degree of contrast, a more complete obliteration of unwanted shadows, and a more sharply outlined general detail than are usually obtained with simpler apparatus. Nevertheless, we agree that elaborate and costly apparatus is not essential for tomography, and Twining (1937) and Colyer (1937), working independently in this country, and Ziedses des Plantes (1932) in Holland, have all shown that simple attachments to an ordinary *x*-ray machine can successfully fulfil the requirements necessary for the production of tomograms.

In Grossmann's tomograph the tube and the Potter-Bucky film holder are attached to opposite ends of a pendulum, and in taking a photograph the tube describes an arc, the extent of which can be controlled. The axis in which the pendulum swings can be brought opposite any desired plane in the patient's body, and it is only objects on this particular plane which are sharply defined on the film. The geometrical principles have already been fully outlined in the papers referred to above; further details need not be discussed here.

Twining realized that an ordinary Potter-Bucky couch, embodying as it does two convenient mechanisms—namely, (1) a column capable of moving parallel to the couch, and (2) a Potter-Bucky film carrier moving along the long axis of the couch—was easily adaptable for tomography. By connecting the tube carrier and film carrier by a suitable lever he obtained the movement required—namely, proportional and opposite movement of the film. In this method, as with Grossmann's tomograph, the patient lies in the recumbent position, but in Colyer's adaptation the tube and film carrier move in a vertical instead of a horizontal plane, and thus the patient can be photographed in the upright position. It is claimed that with this technique the upper limit of a pleural effusion or the line of a fluid level in a cavity is not obliterated.

Clinically, the widest application of tomography has been in the field of obscure pulmonary lesions, but whilst our own work has been almost entirely limited to cases of pulmonary tuberculosis, valuable information can be obtained by the use of this method in many other regions of the body. Twining has found it of considerable value in certain bone work—for example, the radiology of thin cancellous bones which are obscured by denser structures: the patella, sternum, and sterno-clavicular joint, temporo-mandibular joint, zygoma, and cribriform plate, the atlas and axis. In addition the larynx, the pharynx, and the nasal cavity can all be investigated by tomography, and more precise information be obtained than by ordinary radiography.

Descriptive Cases

The cases to be described are offered as a further example of the value of the tomograph in the elucidation and localization of cavities, and the more precise analysis and interpretation of complicated fibrotic disease. A full discussion on the clinical value of tomography has already appeared in the *Proceedings of the Royal Society of Medicine* (1938), and readers are referred to this for further details.

CASE I

A patient aged 48, with a four-years history of pulmonary tuberculosis. Fig. 1A is the ordinary radiograph of the chest; the lesion is seen to be fibrotic in type and bilateral in distribution. The *right* lung appears to contain old-standing fibro-cavernous disease of the upper zone, with an area of recent infiltration in the lower zone: the dome of the diaphragm on this side is peaked and adherent, and the costo-phrenic angle is obliterated. The *left* lung shows chronic infiltration over the upper two-thirds, while the lower zone is emphysematous, the diaphragm here being sharply outlined.

Fig. 1B is a tomogram taken at a level of only 5 cm. from the back of the chest. On the *right* side two air loculi are now apparent over the upper and middle zones, being separated by a band of fibrous tissue at approximately the level of the interlobar fissure. Close to the mediastinum, in the inner part of the upper lobe, is a well-defined cavity, and in the lower lobe diffuse infiltrative disease is present. The *left* lung shows generalized fibrotic disease with a well-defined cavity in the mid-zone (which was not apparent on the ordinary film).

We feel that in this case the antero-posterior film gave an entirely incomplete picture of the actual pathological features of the lesion, and in view of the fact that the physical signs in this case were most indefinite, the existence of the spontaneous pneumothorax on the right side must have remained unsuspected in the absence of tomography. The presence of the spontaneous pneumothorax was later confirmed by inserting a pneumothorax needle, when a slightly positive pressure reading was obtained. A thoracoscopy was advised to determine the state of the collapsed portion of lung, but unfortunately the patient refused this investigation.

The entire series of tomograms in this case (not shown here for reasons of space), taken at intervals of 2 cm. from the front to the back of the chest, illustrated very beautifully the gradual appearance of the pneumothorax from the level of the plane of the lung root to the level of the paravertebral sulcus, and also indicated the genesis of the cavity shown in the left mid-zone on the tomogram. The topography of the lesion was thus demon-

strated in a way that we have never been able to equal by any other method of radiological investigation, including lateral, stereoscopic, and oblique films. In this particular case the main lesion was found to be situated in the deeper portions of the lung tissue: this finding has been borne out so often in other patients investigated by us that it would appear that the majority of tuberculous lesions in the lung begin at the back and extend by advancing into the anterior sections. Hence it may often occur that ventral tomograms fail to reveal any evidence of disease, while the dorsal sections may indicate extensive lesions.

CASE II

This patient, aged 30, was admitted with a two-and-a-half-years history of pulmonary tuberculosis. Fig. 2A is the ordinary radiograph of the chest taken on admission. On the *right* side the apex is seen to be cramped and fibrosed, with some "hard" infiltration in the infraclavicular zone. Over the lower zone, in the inner half of the lung field, is a ring shadow; just above the diaphragm the appearance is suggestive of bronchiectasis. The diaphragm itself is well raised, but the patient had not had a phrenic operation. On the *left* side the apex is also cramped, and the upper and middle zones show some increase in the normal striation, but no definite infiltrative disease.

Fig. 2B is the tomogram of this patient taken 5 cm. from the back of the chest; a very large cavity in the right lower lobe is now quite obvious, with small "daughter cavities" at its lower pole.

CASE III

This patient was 18 years old, and had a history of only six months' duration. Fig. 3A, the ordinary radiograph taken in the erect position, reveals a very large cavity occupying the whole of the *left* upper lobe and showing a fluid level; below this is considerable mottling and infiltration. The *right* lung shows fine mottling over the infraclavicular zone, and suggests a recent exudative spread from the main lesion.

Fig. 3B is a *lateral* tomogram taken of the left lung in the plane of the mid-clavicular line: the upper lobe cavity is now seen to occupy almost the entire depth of the lung from front to back. A second cavity is also visible below the large one, and appears to be lying in the paravertebral sulcus close to the bodies of the vertebrae. This second cavity was not seen on the ordinary type of lateral film which was taken in this case, no doubt being obscured by the dense shadow of the vertebral column.

CASE IV

A young man aged 20 was admitted with a three-months history of chest symptoms. His general condition was good and his sputum negative. The ordinary radiograph, shown in Fig. 4A, revealed, on the *left* side, slight infiltration at the apex and more definite infiltration over the mid-zone. The *right* side appears a little hazy, but shows no definite lesion. His blood sedimentation rate was normal and his physical signs were scanty and indefinite; in view of these findings surgical treatment was not contemplated, but to be completely certain of the extent and nature of the infiltration on the left side tomographic investigation was carried out.

Fig. 4B is the median tomogram in this case, taken midway between the front and back of the chest: in the mid-zone of the left lung can be clearly seen a fairly large, well-defined cavity with a good deal of pericavernous infiltration. The right lung is clear.

This cavity was quite obscured on the ordinary film, and a further interesting point in Case IV is that the cavity was revealed in the median section only, and was entirely missed on a preliminary series of films which were taken, thus indicating the great importance of careful "sectioning" in cases with an early lesion.

Because of the tomograph findings, repeated cultural examinations of the sputum were done, and the third specimen cultured on Löwenstein's medium proved to be positive. Meanwhile an artificial pneumothorax had been attempted on the left side, but the pleura was found to be adherent and the induction failed. A left phrenic crush was subsequently carried out, and after five months (during which time he was also at rest) tomography confirmed that the cavity had closed, leaving only a small fibrotic patch. His sputum is now repeatedly negative to culture and the patient has returned to full work.

Conclusions

In view of the many exhaustive papers that have already been published on the additional information given by tomography in the investigation of pulmonary lesions, we have not gone into the discussions of the cases presented here in any great detail, preferring to allow the films to demonstrate for themselves the greater detail and clarity with which a lesion is revealed. A practical point we would stress is that when a large series of tomograms has been taken on an individual patient the films should be placed together on a sufficient number of viewing screens in order that they may be seen *simultaneously*; in this way the gradual change in the distribution of a lesion is emphatically brought out. The method of successive scrutiny of single tomograms on one viewing screen is quite inadequate for the correct assessment of the series as a whole.

We feel that not the least advantage of tomography is the added impetus it gives one to reconsider old problems in a new light, and to delve into the difficulties of the "pathology of the living," to use the late Lord Moynihan's phrase.

It is true that up to the present we have concentrated mainly on the formation and localization of cavities, and the exact determination of the precise area of lung tissue involved by gross disease. But in these days, with the surgical closure of cavities playing an increasingly important part in the treatment of phthisis, it is essential to adopt a more scientific approach to this particular problem than is possible with ordinary methods of radiology of the chest. With very dense lesions, or lesions of homogeneous densities, stereoscopic films are valueless, and with lesions above the clavicle lateral films often fail to be of assistance. But if cavities are to be closed with a minimum of trauma to the patient and a maximum of efficacy, it is essential to know beyond all doubt the *exact* site and extent of the cavities. From the description of the cases given it is obvious that of all the elements of a tuberculous lesion that comprising a cavity system is revealed most clearly by tomography, and we therefore feel that no apology is needed for stressing the value of this mode of investigation for all patients about to undergo a major thoracic operation.

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The London Spectacle Mission, which since 1885 has supplied spectacles to deserving poor persons, is now incorporated with the Royal Surgical Aid Society, which has lately celebrated its jubilee. Nearly 2,000,000 sufferers have been supplied with artificial limbs and other surgical aids through this charitable organization, and now spectacles are added to the many other boons it can bestow.

A COMPARISON OF CLINICAL AND BLOOD PICTURES IN ADULT SCURVY

BY

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(WITH SPECIAL PLATE)

Cases of scurvy such as were described by clinicians in past generations are becoming very rare, and at the same time more and more accurate laboratory methods for diagnosing the malady in a latent or pre-clinical stage are being evolved. So accurately quantitative are some of these tests that there might seem to be little place for the clinician in the diagnosis of scurvy, and a consequent danger that he may miss the condition even in its more flagrant forms. For this reason, and because of the rather unusual and deceptive blood picture in one of our cases, we have ventured to present them in this paper.

Case I

This patient, a man aged 52, had led an active and energetic life, and apart from a period of war service spent in India and Mesopotamia had worked continuously on the railways since the age of 18. He came of healthy stock, with no familial tendencies, was married, but had no children. Twenty years ago he had had malaria, and about seven years ago a severe attack of bronchitis; otherwise he had enjoyed good health. For several years, however, he had noticed a tendency to excessive breathlessness on exertion, but could not date the onset of this symptom.

In August, 1937, he noticed a sudden pain in the right shoulder, which he ascribed to rheumatism. The shoulder was not swollen or discoloured; the pain persisted for about four weeks, and then passed completely away. In November he found on rising one morning that the right knee was swollen. The swelling was followed by pain, which gradually increased in severity over a period of fourteen days and then as gradually passed off. The pain kept him awake at night, but was not increased by movement and did not prevent him from getting about. In December he was admitted to the surgical department at the Postgraduate Medical School for treatment of the condition in the right knee. The knee was found to be grossly swollen, with effusion into the joint and much periarticular bruising and redness. Flexion was possible to a right angle only. It was thought that the condition might be of infective origin, although the Wassermann test, the gonococcal complement-fixation test, and culture of aspirated fluid yielded no positive information. While he was in hospital it was noted that he had anaemia with a colour index below unity and a red count of 3,200,000. Radiographs of the joint showed no recognizable abnormality. With symptomatic measures the swelling and pain in the knee cleared up in three weeks, and he was discharged to the out-patient department for treatment of his anaemia. The anaemia, however, progressed, and by January the red count had fallen to 2,240,000, with a colour index of 1.27. Accordingly he was admitted to the medical department on January 15, 1938, with a provisional diagnosis of pernicious anaemia.

CONDITION ON ADMISSION

The patient was a well-built, cheerful man, with pallor of the mucous membranes and a sallow muddy tinge to the skin; he was not in any pain or distress, and was not dyspnoeic at rest. Temperature, pulse, and respiration rate were normal. The mucosa of the tongue was smooth at the edges but not atrophic. The jaws were edentulous and the gums healthy, with no tendency to sponginess or bleeding. The heart was normal apart from a slight apical systolic murmur. The blood pressure was 155/80. The lungs showed slight emphysematous changes, and the liver was soft and a trifle enlarged; there were no other findings in chest or abdomen. The central nervous system was normal. The right knee was stiff, full flexion not being possible; and there was infiltration and staining of periarticular tissues as a result of former blood extravasation. Multiple small raised petechiae into the hair follicles were present on the extensor aspects of both legs. The patient stated that these had been noticed for some time, but he did not remember when they first occurred as they had never troubled him.

INVESTIGATIONS

Blood Count (15/1/38).—Red cells, 1,900,000 per c.mm.; haemoglobin, 40 per cent.; colour index, 1.05. White cells, 3,000 per c.mm.; reticulocytes, 3.2 per cent.

Price-Jones Curve.—Definitely megalocytic (see chart).

Marrow Puncture.—Definite hyperplasia, the early red cells being more affected than the white cells. Percentages of total marrow cells: haemocytoblasts, 5.5; primary erythroblasts, 39; normoblasts, 14; megaloblasts, 0.5. These findings were compatible with a diagnosis of pernicious anaemia.

Bleeding Time.—Eight and a half minutes.

Coagulation Time.—1 minute 45 seconds (Dale), 12 minutes (Lee)—that is, high normal.

Blood Bilirubin.—0.5 mg. per 100 c.cm.

Urine.—Some red blood cells and leucocytes.

Gastric Juice.—Absence of free acid after histamine.

Gastroscopy (Dr. R. S. Aitken).—Moderately extensive gastric atrophy with several recent haemorrhages in the mucosa.

Electrocardiogram.—Normal.

COURSE AND TREATMENT

On the whole these findings appeared to justify the diagnosis of pernicious anaemia, and liver therapy was at once instituted, at first with anahaemin (8 c.cm. in all) and later with hepastab (14 c.cm. in all). In spite of the high dosage no response was elicited in the blood picture. On February 3 a 600-c.cm. blood transfusion, given with the idea of stimulating the marrow, had no such effect.

The reticulocyte count, while remaining persistently high, showed no crisis, readings fluctuating between 4 per cent. and 9 per cent. being obtained. The blood sedimentation rate corrected for the anaemia present on February 4 was 64 mm. at the end of one hour, and in view of this high reading, the reticulocyte count, and the absence of response to liver a neoplasm was suspected, a suspicion hardened by the finding of occult blood in the stools at this time. Accordingly, full *x*-ray investigations of the principal bones, the thorax, and the abdomen were carried out, but no evidence of neoplasm was obtained. Liver was discontinued and large doses of iron were tried. The blood picture showed at first some slight improvement with iron, but soon relapsed again (Table I).

On February 8 a clue was given to the condition underlying this puzzling blood picture when an effusion of blood occurred into the tissue of the left popliteal space and the lower thigh muscles. By the next day the effusion in the left thigh muscles had increased, forming a deep painful brawny swelling reaching half-way up the under surface of the thigh. On February 14 another effusion occurred into the right ankle, forming an extensive haematoma around the external malleolus, and the discoloration round the right knee increased in extent. On February 22 a haematoma on the right shin with overlying oedema was noticed, and there was a fresh and more extensive bruising of the left thigh muscles (Plate, Figs. 1, 2, and 3).

Clinically the condition now was definitely scorbutic, and inquiry elicited the information that since childhood the

TABLE I

Date	Red Blood Cells per c.mm.	Reticulocytes %	Hb%	Colour Index	White Blood Cells per c.mm.	Polys %	Lymphs %	Large Monos %	Eosins %	Basos %	Treatment
3/12/37	3,200,000		60	0.93	5,000	60	35	3		2	Nil
11/1/38	2,240,000*	2.4	56	1.27	6,000	71	22	3	3	1	Nil
15/1/38	1,900,000	3.2	40	1.05	3,000						Nil
											Liver
21/1/38	2,100,000	6.0	46	1.09	4,000						17/1/38 Anahaemin 4 c.cm.
31/1/38	1,840,000	6.4	38	1.05	5,000	65	33		2		24/1/38 " " "
4/2/38	2,200,000	7.2	38	0.86	4,600	62	32	2	2	2	31/1/38 Hepastab 8 c.cm. 2/2/38 to 7/2/38 Hepastab 2 c.cm. on alternate days
											Blood and Iron
15/2/38	2,900,000		52	0.90	5,000	62	28	7		3	3/2/38 Transfusion 600 c.cm. blood
21/2/38	1,800,000†		34	0.94	3,400	49	45	3	2		7/2/38 to 19/2/38 Ferri et ammon. cit. gr. xxx t.d.s.
											Vitamin C
25/2/38	2,000,000	3.6	36	0.90	4,400	55	35		6	4	
1/3/38	2,200,000‡	5.6	40	0.90	2,400	56	37	1	5	1	22/2/38 to 6/4/38 Ascorbic acid orally 600 mg. daily
8/3/38	3,000,000*		54	0.90	3,200	50	46	3	1		
16/3/38	3,900,000		72	0.92	7,000						25/2/38 Extra dose of 1,000 mg. ascorbic acid orally
22/3/38	4,000,000	1.0	77	0.96	4,500	50	40	5	4.5	0.5	
29/3/38	4,400,000		86	0.98	9,000						
19/4/38	4,800,000		92	0.95	5,000						Orange juice also given from 8/3/38 onwards

* Anisocytosis. † Considerable anisocytosis with many megalocytes. ‡ Anisocytosis and polychromasia.

patient had had a distaste for fruit and fresh vegetables amounting to a phobia, the sight of a tomato or an apple being enough to cause nausea. Most of the meat which he had at home was twice cooked in the form of puddings and pies, and his only source of vitamin C appeared to be potatoes. It was not at the time realized, however, that avitaminosis C could cause such a profound anaemia of a hyperchromic type, and it was thought that it was only a contributory factor in the production of this anaemia. The iron therapy was discontinued on February 19, and on February 22 and the ensuing days quantitative tests for scurvy were performed (Table III).

The decolorization time of intradermal 2:6-dichlorphenol-indophenol on February 22 averaged seventeen minutes, and the total urinary output of ascorbic acid in twenty-four hours was only 6.7 mg. Treatment was at once begun with ascorbic acid, 600 mg. daily by mouth. On February 25 urinary excretion was still deficient, and an extra dose of 1,000 mg. by mouth was given. The total output during the ensuing twenty-four hours, however, was only 12.9 mg. The red cell count had risen to 2,000,000 per c.mm.

On March 5 the haemorrhages into the hair follicles of the leg had completely disappeared, and the larger ones were absorbing satisfactorily. On this, the thirteenth day of treatment, the excretion test showed a greatly increased figure for the first time, the intradermal test having become normal on the fourth day of vitamin C therapy. On March 8 extra vitamin C, in the form of orange juice, was administered, and apparently saturation was achieved a week later, after three weeks' therapy and the administration of over 14 grammes of ascorbic acid; for on March 15 235 mg. of the test dose of 600 mg. were excreted. Throughout this period, on vitamin C therapy alone, steady improvement was made, the red cell count being 3,900,000 per c.mm. by March 16 and 4,400,000 by March 30. As by the latter date the patient's haematoma were completely absorbed, his joints normal, and his other scorbutic signs gone, he was discharged. With continued vitamin C therapy the blood count soon became normal.

Case II

This case makes an interesting comparison with Case I, for it presented more of the commonly described features of adult scurvy. But in spite of certain differences the two cases were obviously examples of the same disease.

The patient, a married man aged 65, had previously been very healthy. From 18 to 41 years of age he had been at sea, often on long voyages of eighteen months or two years. During this time he had seen men with scurvy, but his ships had always allowed rations of lime juice and fresh food. Only in the last four years had his diet become deficient in vitamin C, consisting mainly of porridge, milk puddings, bread and butter, fish, and eggs. His appetite had deteriorated, and at the time of admission was very poor, particularly for fruit, tomatoes, and the like. He felt generally unwell, but his chief complaints when first seen were of pain and swelling of the right knee for two months, and of progressive soreness and swelling of the gums for nine months. The latter had become so bad that he could eat soft food only.

CONDITION ON ADMISSION

On admission into Redhill County Hospital under the care of one of us (G. H. J.) the patient showed anaemia and wasting. The skin of the face, forearms, and hands was of a sallow muddy colour. The gums were striking (Figs. 5 and 6), being swollen, blue, and mauve, and bleeding very readily. The teeth showed marked caries and pyorrhoea, and there was a most unpleasant oral fetor. The right forearm showed a number of subcutaneous bullous haemorrhages, which had been caused by slight injuries a year before (Fig. 4). There were large ecchymoses on the knees, left shin, and left ankle. There were again many follicular petechiae on the shins and around and above the knees. The right knee was distended with fluid. Other symptoms revealed little of note, though there was some arteriosclerosis, and the blood pressure was 180/90. The tourniquet test was strongly positive, the whole forearm being smothered with large petechiae after five minutes of arm compression at 80 mm. Hg.

INVESTIGATIONS

Blood Count (8/7/38).—Red cells, 3,420,000 per c.mm.; haemoglobin, 67 per cent.; colour index, 0.98. White cells, 6,000 per c.mm.; reticulocytes, 0.8 per cent.

Marrow Puncture (15/7/38).—Megaloblasts, 1 per cent.; primary erythroblasts, 2 per cent.; late erythroblasts, 3.5 per cent.; normoblasts, 11.5 per cent.

Bleeding Time.—Less than five minutes.

Coagulation Time.—Three minutes (Wright).

It was unfortunately impossible to get a sample of gastric juice from this patient.

COURSE AND TREATMENT

The patient continued with a diet poor in vitamin C, but from his sixth day in hospital 600 mg. of ascorbic acid were given daily by mouth. By the end of a week's treatment his gums were much better, his bruises were much less marked, and his knee less swollen. After a fortnight's treatment his knee was still slightly swollen, but the gums and the skin were almost entirely free of haemorrhages. The tourniquet test by now was much less positive, fifty tiny petechiae being produced. On the fourth day of treatment there was a reticulocytosis (6 per cent.), but the anaemia again only improved slowly (Table II). As in the first case, however, the anaemia was completely cured as a result of vitamin C therapy, in this instance after about a month's treatment. At the time of the last blood count the tourniquet test was almost negative, only five minute petechiae being produced.

prominent. In view of the recent importance attached to the discovery of latent scurvy as a cause of ill-health and its appearance after comparatively short periods of time in the dietary treatment of peptic ulcer (Bourne, 1938), it is interesting to observe from the first case the length of time during which scurvy will remain latent. It is fair to assume that for forty years at least this man had lived on a diet grossly deficient in vitamin C, and yet only for a few years had he had any symptoms. The first of these symptoms, dyspnoea, was presumably due to anaemia, and had been present increasingly for three or four years. In his case the haemorrhagic symptoms had only just appeared when he was seen, but Schultzer's (1936) cases show that severe haemorrhagic phenomena may make scurvy evident before anaemia has developed.

TABLE II

Date	Red Blood Cells per c.mm.	Reticulocytes %	Hb %	Colour Index	White Blood Cells per c.mm.	Polys %	Lymphs %	Large Monos %	Eosins %	Basophils %	Treatment
7/7/38	3,420,000*	0.8	67	0.98	6,000	63	27	8	1	1	Nil
15/7/38	3,500,000*	6	70	1.0	8,500	71	19	9	1		12/7/38 to 9/8/38 600 mg. ascorbic acid daily; fruit juice also daily from 27/7/38
30/7/38	4,400,000†	1.5	76	0.85	6,500	74	22	4			
15/8/38	4,500,000		94	1.0	11,200	65	29	5	1		

* Slight anisocytosis, poikilocytosis, and polychromasia. † Slight anisocytosis.

The treatment given to this patient was 600 mg. of ascorbic acid daily by mouth. All other vitamin-C-containing food and iron-containing food was excluded from his diet as much as possible until July 27, when a liberal allowance of fresh fruit was introduced. The excretion of ascorbic acid in the urine was estimated daily (Table IV), and it was found that saturation was reached on the twelfth day of treatment and after the administration of 6.6 grammes of ascorbic acid. As might have been anticipated from the shorter history of deprivation, this case was less desaturated in vitamin C than Case I. With the general improvement in the patient's condition his appetite improved, and when seen recently he reported that he was "eating like a horse" and taking plenty of fruit.

Discussion

There are many features of interest in these cases, and not the least is that they were married men with devoted wives. Schultzer (1936) and others have drawn attention to the liability to scurvy of single and solitary men, but the first patient was most unwilling to come into hospital because only his wife was able to give him "the food that suited him." She had indeed, with the best will in the world, severely and carefully limited the vitamin C in his diet for many years! His extreme aversion to fresh fruit and vegetables, which appeared to have increased with the severity of the scurvy, was another interesting feature. After his scurvy had been successfully treated he was able to take fruit juice with a certain amount of relish.

The clinical features in these cases were, of course, quite typical: the sallow muddy complexions; the extravasations of blood behind the knees (Figs. 1 and 3) and around the ankle (Fig. 2); the swollen knee-joints; the oedema; the petechiae in the hyperkeratotic hair follicles on the legs (Fig. 3); and the spongy gums in Case II (Figs. 5 and 6).

Bondurant (1934), Schultzer (1936), and Nisenson and Cohen (1937) have all recently reported similar cases, and among these and other recent ones the characteristic gum bleeding and mouth fetor occurred only occasionally. In the other cases teeth had been removed, and the most obvious evidence of scurvy was not therefore

The anaemia in this case was of peculiar interest, and because it proved deceptive to us we now propose to consider it in detail. The blood counts and their relation to the treatment given are shown in Table I. The megalocytic and hyperchromic tendency of the anaemia up to the time of vitamin C therapy is evident from this table and from the Price-Jones curve (see chart) of January 11. On January 11, before any treatment, the mean corpuscular volume was 113.6 $c\mu$ (normal, 75.7 to 96 $c\mu$), and there was anisocytosis. A little later the sternal marrow showed a hyperplasia chiefly affecting the early red cells, and the gastric juice revealed an achlorhydria. The blood cells at this time showed also a considerable variation in density of staining.

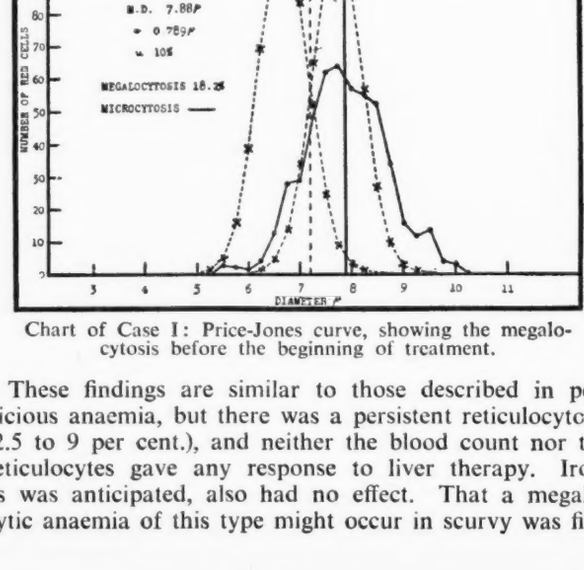
IDEAL CURVE FOR THE SMALLEST (3σ) MEAN DIAMETER (6.686μ) WITHIN NORMAL LIMITS
M.D. 7.88μ
σ 0.789μ
v 10%
MEGALOCYTOSIS 18.2%
MICROCYTOSIS
NORMAL MEAN 7.20 μ
STUDY MEAN
IDEAL CURVE FOR THE LARGEST (+3σ) MEAN DIAMETER (7.718μ) WITHIN NORMAL LIMITS
NUMBER OF RED CELLS
DIAMETER μ

Chart of Case I: Price-Jones curve, showing the megalocytosis before the beginning of treatment.

These findings are similar to those described in pernicious anaemia, but there was a persistent reticulocytosis (2.5 to 9 per cent.), and neither the blood count nor the reticulocytes gave any response to liver therapy. Iron, as was anticipated, also had no effect. That a megalocytic anaemia of this type might occur in scurvy was first

suggested by Mettier, Minot, and Townsend (1930), who found that in the severe anaemia of some scurvy cases there might be enough red cells larger than normal to suggest a diagnosis of pernicious anaemia. Nisenson and Cohen (1937) have described a severe case of scurvy, very much like Case I, with marked anaemia and a colour index of 1.16. Among eight cases of infantile scurvy Parsons and Smallwood (1935) report one case of megalocytic anaemia, while two of their anaemia cases were normocytic and orthochromic, and two were hypochromic. Three cases had no anaemia at all. Mettier, Minot, and Townsend state that of cases of clinical adult scurvy a third are not anaemic, while half the remainder are severely anaemic and half moderately anaemic. As a general rule they found an orthochromic normocytic anaemia in scurvy, and this type of anaemia, shown by the second case, has also been found by Bondurant (1934) and Wood (1935).

The anaemia of scurvy is attributed by Parsons and Smallwood to deficient oxygenation of the marrow. Vitamin C takes up oxygen and releases it in the tissues, and when vitamin C is deficient in the marrow the maturation of red cells is retarded by lack of oxygen. While the stage of maturation of normoblasts to erythroblasts is most usually disturbed, the megaloblast maturation to normoblast may be chiefly affected in some cases, as in the first case just described. This case, with a very low level of vitamin C in the tissues, showed in the marrow a great interference with the maturation of the early cells of the red cell series, and a severe megalocytic anaemia resulted. Case II, with a less marked vitamin C desaturation of the tissues, showed no definite interference with the maturation of the early red cells and only a moderate normocytic anaemia. Such findings suggest that there is some relation between the extent of vitamin C lack in the tissues and the point at which marrow-cell maturation is chiefly affected.

In cases of scurvy anaemia, vitamin C administration provokes a reticulocytosis (see Case II), but the high reticulocyte count in Case I before treatment is a curious finding, though it was a feature to a lesser degree (2.5 per cent.) in Nisenson and Cohen's megalocytic case. The hypochromic anaemias found in scurvy result from blood loss and an associated iron deficiency, and in such cases a partial response to iron may be expected.

Achlorhydria may be a contributory factor in producing scurvy, as was pointed out by Schultzer (1933); for vitamin C is only stable in an acid medium. Injection therapy is therefore preferable in such cases.

We employed as confirmatory of the diagnosis of clinical scurvy three tests which have been used to make the diagnosis of latent scurvy. These were the ascorbic acid saturation test of Abbasy (1935); Rotter's intradermal test with 2:6-dichlorphenolindophenol (Rotter, 1937); and the capillary resistance test. The position of these tests in relation to scurvy in general and to our cases in particular may be summarized briefly as follows:

1. THE ASCORBIC ACID SATURATION TEST OF ABBASY

In this test the patient is kept on a diet free of vitamin C, and after a short control period 500 to 1,000 mg. of vitamin C (ascorbic acid) is given daily by mouth and the amount excreted in the urine is estimated. The saturation point is usually reached when half the quantity administered daily is excreted, but even on vitamin-C-free diets some ascorbic acid is excreted by severe cases of scurvy (Schultzer, 1936). All Schultzer's cases excreted as much as 17 mg. daily, and one excreted 33 mg. under these conditions.

Our first case was given 600 mg. of ascorbic acid by mouth on all the days shown in Table III, except on the fifth day (February 25), when an extra 1,000 mg. was given, also by mouth. Fruit juice was added from March 8 to 14, and was discontinued for the excretion test on March 15. The table reveals several interesting facts, the first being the comparatively large amount of ascorbic acid excreted when the body was still as markedly desaturated as it was on the day preceding therapy and in the early days of treatment. Also interesting was the long delay of eight days before there was any appreciable increase in the amount excreted. In the last place, if

TABLE III.—*Results of Quantitative Tests for Scurvy in Case I*

Date	Daily Amount of Ascorbic Acid Excreted	Volume of Urine	Daily Amount of Ascorbic Acid Administered
	mg.	c.cm.	mg.
21/2/38	6.7	1,180	Nil
22/2/38	14.9	950	600
23/2/38	9.3	790	600
24/2/38	15.9	1,000	600
25/2/38	14.9	1,305	1,600
26/2/38	12.9	1,220	600
27/2/38	—	—	600
28/2/38	14.5	1,310	600
1/3/38	13.5	1,230	600
2/3/38	12.9	750	600
3/3/38	27.8	1,310	600
4/3/38	44.7	970	600
5/3/38	110.0	1,160	600
6/3/38	85.2	1,270	600
7/3/38	54.7	1,030	600
15/3/38	235.2	1,690	600

TABLE IV.—*Results of Quantitative Tests for Scurvy in Case II*

Date	Daily Amount of Ascorbic Acid Excreted	Volume of Urine	Daily Amount of Ascorbic Acid Administered
	mg.	c.cm.	mg.
8/7/38	5.5	292	Nil
9/7/38	7.4	356	Nil
10/7/38	18.4	469	Nil
11/7/38	7.0	234	Nil
12/7/38	9.4	347	600
13/7/38	18.3	571	600
14/7/38	11.6	365	600
15/7/38	13.9	395	600
16/7/38	29.5	785	600
17/7/38	6.9	200	600
18/7/38	22.5	925	600
19/7/38	74.2	1,050	600
20/7/38	147.0	1,260	600
21/7/38	74.0	900	600
22/7/38	128.0	1,050	600
23/7/38	348.0*	675	600
26/7/38	270.0	820	600

* Only a half-day's specimen.

50 per cent. excretion of administered ascorbic acid indicated saturation, our first patient was apparently just short of this point after three weeks' treatment. By then 13.6 grammes of ascorbic acid tablets had been administered and much more had been given in fresh fruit, a considerable difference from the 0.5 gramme to 2.3 grammes which Wilkinson and Portnoy (1938) find will saturate a normal person.

Case II, as previously pointed out, was much less deficient in vitamin C, and was saturated after eleven days' treatment and the administration of 6.6 grammes of ascorbic acid (Table IV).

2. Rotter's Intradermal Test (1937)

In Table V the times of decolorization by Case I of an intradermal spot of the blue dye 2:6-dichlorphenolindophenol are charted. As described by Wilkinson and Portnoy (1938) 0.01 c.cm. of a solution of the dye (2 mg. in 4.9 c.cm.) was injected intradermally in four places. Normally the blue spots are decolorized within ten minutes, and this was the case in our healthy controls. But in cases of rheumatism, rheumatoid arthritis, and other infective conditions we found the time to be prolonged (up to thirty minutes in one instance). In scurvy it is usually much prolonged, and Case I at first showed average decolorization times of seventeen and twenty-one minutes. But after three days of oral ascorbic acid treatment the time became normal.

Table V

Date	Average Decolorization Time of Four Intradermal Tests	Treatment (Oral Ascorbic Acid)
	minutes	mg.
22/2/38	17	600
23/2/38	21	600
25/2/38	7½	1,600
26/2/38	8	600
1/3/38	8	600
2/3/38	7	600
12/3/38	4	600*

* Fruit juice also given from March 8.

It will be observed by comparison of Table III with Table V that the cutaneous dye test shows a normal result much more quickly than the excretion test—that is, it becomes normal in the presence of vitamin C deficiency. This fact was further exemplified by Case II, the patient giving a normal result (three to six minutes) before any treatment. Inquiry revealed that in the week before admission he had taken two bottles of lime juice, his only appreciable intake of vitamin C in four years. It is possible that this was the cause of his normal intradermal test time, though he was still very deficient in vitamin C and clinically a clear case of scurvy.

3. The Capillary Resistance Test

This test has slight technical variations, and for the cases in this paper a pressure of 80 mm. Hg was sustained for five minutes. Dalldorf (1931) has shown that in the experimental scurvy of guinea-pigs a decreased capillary resistance is the first sign of the disease. Bourne (1938) has used the test to disclose latent scurvy during the treatment of peptic ulcers, but it must be remembered that normal people may at times give positive results to variable small extents. The height of the blood pressure and the state of the vessels influence the results. For these reasons it is perhaps not surprising that Case II initially gave a far more extensive response to the test than did Case I. In Case II numerous large petechiae appeared over the whole forearm; in Case I there were about fifty petechiae in the antecubital fossa. In both cases the test results approached normal very early in treatment. In Case I the result was negative on the eighth day, and by then the skin petechiae elsewhere were almost gone. This early decrease in capillary permeability corresponding with the rapid clearance of the haemorrhagic manifestations has been commented on by Schultzer (1936), and is the converse of Dalldorf's observation. In Case II the capillary response was a little slower, being almost negative by the fifteenth day and quite negative at the end of a month's treatment. Rather surprisingly in Case I it was found that on the thirty-fifth day of treatment the test was again definitely positive. Schultzer (1936) has also commented on this variation in the result of the capillary resistance test in cases of treated scurvy. In this connexion it is interesting to note that Greene (1934) found a positive tourniquet test in 10 per cent. of healthy children and only a similar number of positive results in a group of children who might have been suspected of latent scurvy. He found variations in the test from time to time, and even a difference between the responses on the two arms of a normal subject.

Summary

Two cases of adult scurvy have been described which showed many of the classical features of the disease. The first case revealed a megalocytic anaemia not often associated with scurvy. A constant reticulocytosis, polychromasia, anisocytosis, and leucopenia were also observed in this case. A hyperplastic bone marrow showing many early red cells, a smooth tongue, gastric mucosal atrophy, and achlorhydria were further features of the case which simulated those of Addisonian anaemia. This case has been contrasted with a second case in which the anaemia was of the more usual orthochromic and normocytic type, and in which the characteristic gum lesions made the diagnosis evident, although the latter was otherwise a less severe case. An attempt has been made to find some relation between the clinical and haematological differences in the two cases and the different vitamin C levels demonstrated in their tissues by an excretion test. The initial differences of tissue vitamin C levels in the two cases seemed to be related to the lengths of their respective periods on scorbutic diets. The value of the intradermal test and the capillary resistance test in the diagnosis of scurvy has been discussed.

In the first case a megalocytic anaemia failed to respond either to liver or to iron, but in both cases the anaemia was cured solely as a result of vitamin C therapy. The clinical pictures improved more rapidly than the blood pictures. The comparative slowness of the responses in the blood might have been ascribed to defective absorption of the orally administered vitamin C as a result of an atrophic alimentary mucosa and lack of gastric acid. But the early disappearance of the superficial manifestations of the disease and the early normality of the intradermal test make this explanation unlikely. The great ascorbic acid desaturation of all the tissues, particularly in Case I, is the probable explanation of the slowness of the blood response. In Case I it is evident that the anaemia was much the earliest manifestation of the disease, so that it is not surprising that it should have been the last to disappear. The history of this case showed that

vitamin C deficiency must have been present for many years before the scurvy became clinically manifest.

We are indebted to Dr. Janet Vaughan, Dr. R. G. MacFarlane, and Dr. G. A. D. Haslewood for help with the investigation of the first case, and to Dr. J. H. Patterson for similar assistance with the second. The first case is published by permission of the Chief Medical Officer of the L.C.C., and the second by permission of the Chief Medical Officer of the Middlesex County Council.

*** Through a clerical error, discovered too late, Surgeon Lieutenant A. J. Glazebrook's initials are incorrectly given on the plate.

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Clinical Memoranda

A Tumour of the Male Breast

This case, recently under my care, appears to be worth recording by reason of the very interesting differential diagnosis.

Clinical History

On October 4, 1937, I admitted a man about 35 years of age, complaining of a lump in his left breast. His attention had been first drawn to it eight months earlier by pain, though the pain had at no time been at all severe. Since then the size of the tumour had slowly increased. He also complained of pain in the right knee and ankle. He was thin, and had evidently lost a good deal of weight.

On examination there was an obvious lump in the left breast, mainly in the right upper quadrant. It stood out about three-quarters of an inch from the chest wall, was roughly oval in shape (2½ in. by 2 in.), and the margins were ill defined. There was no change in the skin. On palpation the tumour was of firm consistence and did not fluctuate. It was attached to the deeper structures, being fixed to the chest wall, but not adherent to the skin, which was freely movable over it. The lump was not at all tender. In one part over the third rib there was just palpable a very narrow ridge of bone standing up one-eighth of an inch or less, and running across the rib. In the axilla were two enlarged, firm, painless, discrete, and freely movable glands, the largest of which, the size of the shell of an almond, it was easy to take up with the fingers. There were one or two similar but smaller glands in the subclavicular region, but the clavicle appeared free above. There were no abnormal physical signs in the chest, and the patient had no cough. On admission he had a temperature of 99.8° F., which responded to quinine at once. (I had treated him for malaria about two weeks previously.)

Differential Diagnosis

The diagnosis appeared to lie between tuberculosis and carcinoma, although a sarcoma and gumma had also to be borne in mind.

Against carcinoma there were the following points: (1) Carcinoma is reputed to be very rare amongst the natives, although in my nine months out here I have had several cases. (2) The first symptom being pain, though at no time was pain a marked feature, and there was a complete absence of tenderness on examination. (3) The presence of the small bony ridge. In favour of carcinoma there were: (1) The general impression on examining the tumour. (2) The consistency and mobility of the glands. A supporting factor was the presence of pain in the knee and ankle, possibly of metastatic origin. There was no local abnormality to be discovered.

Against tuberculosis there were: (1) The absence of pyrexia save for that which responded to the quinine. (2) The absence of fluctuation. (3) The absence of any evidence of perilymphadenitis. (4) No evidence of any other focus of infection. In favour of tuberculosis there were: (1) The presence of the bony ridge, suggesting a bony origin of the tumour. (2) The extreme frequency of all types of tuberculous infection in this part of Central Africa. (3) The deep attachment with no skin involvement, though a sinus might have been expected. (4) Pain being the first symptom.

Operation

A radical operation was decided upon. The axilla and subclavicular region were cleared of infected glands. No evidence of periglandular reaction was found. On turning the pectoralis minor forwards and inwards a tuberculous abscess was found in the muscle, larger in size than a large walnut: it was in direct communication with an abscess in the third rib. There was a small bony ridge to the left margin of the opening into the bone. As the general condition of the patient contraindicated a partial resection of the rib the bony cavity was scraped and filled with bipp. There was an uneventful recovery.

Discussion

I consider that the presence of the bony ridge was of important diagnostic significance. I shall be interested to learn if the presence of such a ridge, due presumably to the hyperosteitic reaction sometimes found in tuberculous infection of the bone, has often been noticed in these lesions of the ribs. A blood count might have helped in the diagnosis, and a radiograph certainly would have, but there are no facilities for this out here.

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Drainage of Pelvic Abscess in Acute Appendicitis

In cases of acute appendicitis with rupture of the appendix it is common to find, especially in late cases, that an abscess has formed in the bottom of the pelvis. This abscess is most safely and conveniently drained by the introduction of a tube through a small suprapubic incision.

I have devised a simple, quick, and easy method of doing this, as follows:

Place an ordinary sewing thimble on the forefinger of the left hand and introduce it through the wound made for the removal of the appendix, keeping it close to the anterior abdominal wall, till the tip reaches the central suprapubic position. The finger is now pressed against the anterior abdominal wall, and an incision, about three-quarters of an inch long, is made over and down to the thimble, which can be felt under the skin. The thimble is now pushed up through this incision and removed. A drainage tube is then placed on the tip of the left forefinger and guided by it down to the abscess cavity. By this method there is no danger of incising distended bowel, distended bladder, or the operator's finger.

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Reviews

RESPIRATION

Adventures in Respiration. Modes of Asphyxiation and Methods of Resuscitation. By Yandell Henderson. (Pp. 316; 15 figures. 3 dollars.) Baltimore: Williams and Wilkins; London: Baillière, Tindall and Cox. 1938.

This book contains two very interesting photographs of the Pike's Peak Expedition of 1911, showing some of the members busy with scientific observations at high altitudes. One of the members is the late John Scott Haldane, to whose memory the book is fittingly dedicated. It was during talks on respiration while on that expedition that the ideas set forth in the present book began to take shape. In 1885 Miescher of Basle wrote, "Over the oxygen supply of the body carbon dioxide spreads its protecting wings," but it was not until 1905 that the pressure of carbon dioxide in the arterial blood was proved—by the Oxford school under Haldane—to be the main controlling mechanism of respiration. Throughout his long scientific career Professor Yandell Henderson has also been engaged with similar researches concerning carbon dioxide and other gases, and he is part-author of the standard book *Noxious Gases*. In these labours he has been assisted particularly by Dr. Howard W. Haggard, and the present book is written chiefly around some of their joint researches, many of them dealing with public health problems investigated for the U.S.A. Bureau of Mines. This work has led Professor Henderson towards two new conceptions, which are now dealt with in detail. One is that of muscle tonus as a major factor in the control of the circulation and of failure of muscle tonus as a cause of failure of circulation. He considers that carbon dioxide at a normal pressure in the tissues is necessary for normal muscle tonus, which is required to maintain normal venous pressure, and this in turn helps to maintain a normal circulation. The other conception is that of "acarbia" (lack of carbonates in the blood) as induced by "hyperpnein" (hypothetical substance or condition produced by muscle contraction and stimulating the respiratory centre) in place of "acidosis" induced by lactic or other acid. He thus includes two stimulants for the respiratory centre—namely, carbon dioxide and "hyperpnein." Hyperpnoea removes not only carbon dioxide from the blood but also bicarbonates, which pass into the tissues.

The book is mainly of interest to researchers working on the study of respiration. When dealing with acclimatization to high altitudes the author unduly neglects all other systems, particularly the cardiovascular system, which really cannot be so precisely separated from the respiratory or any other system. The term "acclimatization" is also used rather loosely. Low oxygen pressure experiments on mammals and observations on natives attempting to live continually near 20,000 feet in the Andes prove that there can be no complete acclimatization much above 20,000 feet. Professor Henderson also deals rather leniently with the theory of oxygen secretion by the lungs, since studies of oxygen pressures in the tissues during prolonged exposures of mammals to low oxygen pressure in the air or to chronic carbon monoxide poisoning prove that there is no active secretion of oxygen by the lungs. He also says—rather courageously—that there is no chronic carbon monoxide poisoning in man, but there are many animal experiments dealing with this state—that is, continual exposure to non-fatal concentrations of carbon monoxide. Further, the value of oxygen administration near the summit of Mount Everest seems to us to be underestimated.

For the medical practitioner there are important and interesting facts scattered throughout the book. A disadvantage is the absence of a short summary to each chapter, which would so much help the clinician. To sum up recommendations: carbon dioxide should be administered temporarily—either with fresh air or pure oxygen—when there is depression (without paralysis) of the respiratory centre—for example, in carbon monoxide poisoning and asphyxia neonatorum. Also it should be given to remove anaesthetics after operations—that is, to prevent post-operative complications; for example, atelectasis of the lung and pneumonia. Of course, rebreathing is used in anaesthesia to prevent over-removal of carbon dioxide from the blood. Professor Henderson also recommends carbon dioxide to help to preserve muscle tonus in shock, but it is harmful in conditions which resemble that produced by injections of acids. Moreover, carbon dioxide is useless in complete paralysis of the respiratory centre; here oxygen should be insufflated into the lungs. The author recommends caffeine (coffee) and not lobeline as a respiratory stimulant, and gives his support to strychnine as a therapeutic measure in loss of muscle tonus (shock).

The bibliography is complete as regards the author's own publications, around which the book is written. Search in the text for the proper authority for any particular statement is thus not always easy, and there are few dates in the text to help application of the references which are given in the bibliography. The book is written in the author's usual vigorous and very entertaining style, and recalls many interesting scientific incidents and adventures of peace and war.

DISEASE AND ITS SOCIAL SETTING

Cliniques de Médecine Sociale à l'Hôpital Saint-Pierre. By Dr. René Sand. (Pp. 187. 20 fr.) Brussels: Jean Vromans. 1938.

Those who were interested in Dr. René Sand's suggestive and informative book *L'Économie Humaine* (reviewed in these pages on October 24, 1932, p. 732) or in its English translation *Health and Human Progress* (reviewed on December 21, 1935, p. 1211) will welcome this book. It is the obvious sequel to the first, for it shows how Dr. Sand has put into practice his doctrine that sociology and clinical medicine are closely related. Dr. Sand, in addition to being secretary-general of the Public Health Ministry of Belgium, is professor of social medicine (the first of the kind anywhere) in the University of Brussels. These lectures have been published as an incentive to others who may believe, as he does, that the practical application of his doctrine is urgently needed.

In his former book Dr. Sand showed the great part that medical science is playing in the science of sociology, and argued that it could do much more if the knowledge already acquired could be systematized and taught as an essential part of clinical medicine. His dual position has enabled him to show how it can be done. The ten lectures described in this book were given to his students, with the collaboration of a clinician. The intention is not so much to contribute to the teaching of medicine or of sociology as to show, by taking concrete examples, the connexion between certain maladies and the social conditions of the patients. The subjects dealt with are: anaemia due to poverty, pulmonary tuberculosis, lupus, Pott's disease in adults, pregnancy and syphilis in

unmarried women, diabetes necessitating a change of employment, rheumatism, weakly children, mentally deficient children, and syphilis and hereditary syphilis.

The effect of reading the studies of the individual cases discussed reminds one of what might be the result of an examination of the case in this country by a super-almoner and a medical man of broad sympathies and clinical acumen. The lecturer gives what he calls a "social diagnosis" followed by "social treatment" in the course of which the students are informed of the various social measures at the disposal of the doctor. It is not suggested that the doctor should take the place of the almoner or the public assistance officer, but that he should realize that all his medical prescriptions may be of little effect if the social factors at work are not evaluated and dealt with. Dr. Sand ends his stimulating lectures with these words to his students: "Though we have had for more than fifteen years an organized social service covering the whole nation, it is evident that a long education will be required before its principles penetrate the ensemble of our public assistance and private charity. I trust that you will desire to contribute to this education by your personal action."

A. C.

THE VIRUS OF LYMPHOCYTIC MENINGITIS

La Maladie d'Armstrong: Chorio-méningite Lymphocytaire. Une Nouvelle Entité Morbide? By Boris Kreis. (Pp. 160; 14 figures. No price given.) Paris: J.-B. Baillière et Fils. 1937.

The discovery by Armstrong and his associates that certain cases of benign lymphocytic meningitis in man were due to a virus which they had previously found as a spontaneous or accidental infection of laboratory monkeys gave fresh interest to this disease. Dr. Boris Kreis has now collected all the known facts about this virus, as well as his own studies of it, in a small monograph. The virus has two interesting characteristics. So far as we know it is the only virus which may be found in the cerebrospinal fluid of man. It is also the only virus which may be communicated to man under natural conditions from mice. The evidence for the latter is not conclusive, but there seems to be little doubt that it occurs as a natural epizootic in both white and grey mice, and it can be found in the urine of infected mice. Other laboratory animals are less susceptible to infection, and the fact that some batches of mice show a varying degree of immunity to the virus makes its study more than usually difficult.

The relation of the virus to human disease is still uncertain. Although it, or a closely similar virus, has been recovered from human cases of lymphocytic meningitis in England, France, and North Africa, as well as in America, less than twenty strains have so far been isolated, and in the majority of cases which show the clinical picture of benign lymphocytic meningitis, and which have been examined, the cerebrospinal fluid has not contained any virus. It seems probable that these cases may be due to more than one type of virus; those of mumps and of "louping ill" have been definitely incriminated in some cases, and the relation of others to epidemics of influenza suggests that the recently discovered virus of this disease may be sometimes responsible.

Dr. Kreis has tried subcutaneous inoculation of this virus in the treatment of two cases of general paralysis, and has shown that it is possible to infect human beings, but this seems to have no therapeutic value.

DISEASES OF THE CHEST

Introduction to Diseases of the Chest. By James Maxwell, M.D., F.R.C.P. (Pp. 328; 95 figures. 12s. 6d. net.) London: Hodder and Stoughton. 1938.

The responsibility attached to the writing of a textbook for medical students is a heavy one, for the undergraduate of to-day is the doctor of to-morrow and of many years afterwards, and the general practitioner finds it hard to keep abreast of developments and changes in medical science and practice. It is all the more important, therefore, that the student should have impressed upon him early in his career correct basic principles and a sense of proportion. This is just what one would expect in an introduction to a special branch of medicine, particularly when this concerns a branch that has witnessed so many fundamental changes in recent years as has diseases of the chest. We feel that Dr. Maxwell has not been altogether successful in his attempt to do this, chiefly perhaps because he has tried to be too comprehensive with an eye to the student's examination requirements. For this purpose the book should serve admirably. On the other hand, it contains, apart from much sound clinical advice based on the author's experience, several statements, repeated in textbook after textbook, that have never been scientifically confirmed, and classifications that are not only useless but may be misleading in actual practice. Again, though the teaching of pathology is not the prime purpose of the book, sound pathological notions are essential for a proper understanding of the clinical aspects of disease. In this respect Dr. Maxwell is not always quite up to date. Finally, the illustrations, which consist almost entirely of skiagrams reproduced on a small scale, may confuse rather than assist the student because of the inadequate captions and the absence of their detailed explanation in the text.

Despite the above criticisms Dr. Maxwell's book should be of value, for it succeeds in its purpose—"to present to the student the clinical aspects of respiratory disease, to correlate the history with the physical examination, and to indicate the various special investigations which are likely to assist in making an assured diagnosis."

A METHOD OF ANATOMY

A Method of Anatomy: Descriptive and Deductive. By J. C. Boileau Grant, M.B., Ch.B., F.R.C.S.Ed. (Pp. 650; 564 figures. 27s. net.) London: Baillière, Tindall and Cox. 1937.

This work, by Dr. Boileau Grant of Toronto, is a departure from the traditional precepts of the older textbooks of anatomy. The author has studied the subject principally from the mechanical standpoint, and has sought to correlate anatomical facts by considering their mutual relations and purpose. In this respect he has been specially successful; for example, in his descriptions of the articulations, and in his account of these and of other systems, such as the skeletal and muscular, he has contributed many useful new observations which are of practical importance. The general trend of the book is confined to the spatial relationships of one structure to another, with brief statements on the significance of these contacts.

Unfortunately, though the descriptions in the text are for the most part regional, the general appearance of the regions as a whole are not depicted in such a way that a student, approaching the subject for the first time, would be able to recognize easily the individual structures or organs that he is investigating. Thus, there are very few illustrations giving the complete picture of such regions as

the back, the front of the forearm and palm of the hand, or the extensor region of the leg and dorsum of the foot. A complete view of such muscles as the trapezius and latissimus dorsi, or of the gluteal region after reflection of the gluteus maximus muscle, is invaluable. Since these illustrations usually form the first introduction to the student's general conception of the parts under consideration and serve as an example of how the parts should be displayed in a good dissection, their absence must be regarded as a grave defect. Moreover, the technique of the illustrations, as a whole, is much below the modern standard of achievement, and there are numerous crudities of expression—for example, U.-G. TRACT & CO., or G.-I. TRACT & CO.—both in the legends and text, which, combined with a lack of uniformity in spelling, gives an impression of carelessness, in place of one of the most valuable side-issues which arises indirectly from a sound training in anatomy—namely, a scrupulous regard for exactitude in observation and respect for niceties in literary expression.

There are also some very important limitations in the scope of the book. Thus, we find no description of the brain or spinal cord, and there is little or no indication, either in the figures or in the text, of the internal structure of such organs as the spleen, liver, salivary or ductless glands. The surroundings of these organs are accurately described, but the contained organ appears to be regarded as a "cast of the mould," and the reader is, in one instance, informed that if (he) "makes a careful study of the mould (he) need not devote time to the cast which is but a counterpart of the mould." A "careful study" is, however, advocated and described, for example, of the membranes which surround the brain and of the capsule of the parotid and other glands along with the related nerves and vessels; and if it is borne in mind that the book deals with the form rather than with the internal structure of the organs described it may be recommended as a help to the comprehension of the subject from the mechanical standpoint and as a supplement to those general treatises which give a more complete account of the structure and development of all the important organs and tissues.

Notes on Books

The sixth supplementary volume of HEFFTER'S *Handbuch der Experimentellen Pharmakologie* contains two articles: one by Professor Gessner of Halle, which deals with animal poisons, while the second, by Professor George Bayer, describes the alkaloids of ergot. The subject of animal poisons is a very wide one, and the author has summarized briefly, in about eighty pages, the important advances that have been made since 1924, when Professor Faust reviewed the subject in Heffter's textbook. The article will be found very useful for reference by those working on such problems as the pharmacology of snake venoms. Ergot was previously dealt with in Heffter's textbook in an article written by the late Professor A. R. Cushing in 1914 and published in 1924. Professor Bayer contributes an authoritative review of the chemistry and pharmacology of the alkaloids of ergot, on which he has worked for more than thirty years. These alkaloids have presented peculiar difficulties both to chemists and to pharmacologists. Tarret in 1875 isolated a crystalline alkaloid from ergot, but it was not until 1936 that the most important alkaloid—namely, ergometrine—was isolated. Similarly, the pharmacological action of ergotoxine was determined in 1906, but the action of ergometrine was not demonstrated until 1932, although it would now appear that the action of ergot in childbirth, upon which depended its introduction into clinical use, is due more to the ergometrine than to the ergotoxine content. Professor Bayer gives a full account of the pharmacological evidence, which, owing to this slow development in knowledge, is confused and often contradictory. The monograph concludes with an article on the history of ergotism. Professor Bayer's clear review of this difficult subject, with its long and confused history, is of great value. The volume is published in Berlin by Julius Springer at RM. 30.

Drugs, their Use and Abuse (Kegan Paul, Trench, Trubner and Co., 7s. 6d.), by LOUIS LEWIN, is an English translation of the second German edition of *Phantastica*. The author is renowned for his encyclopaedic knowledge of drugs and their history. The volume under review deals with the drugs of addiction, which the author divides into five classes: euphorica—for example, morphine and cocaine; phantastica—for example, mescal and cannabis indica; inebriantia—for example, alcohol and the anaesthetics; hypnotica—for example, chloral hydrate and veronal; excitantia—for example, coffee and tobacco. A special feature of the volume is that it gives an account of the effects not only of the well-known drugs of addiction but also of rarer varieties, such as mescal, banisteria, loco weed, etc. It provides interesting and easy reading, since the author gives many accounts of the strange habits of peoples in all parts of the world, and the translation has been carried out very successfully.

Preparations and Appliances

IMMERSION AUTOCLAVES

Messrs S. Maw, Son and Sons, Ltd., have devised a simple apparatus wherewith moist heat at temperatures above 100° C. can be applied to instruments such as syringes or to vessels containing solutions in order to ensure complete sterilization. It consists essentially of a strong metal cylinder with a pressure-tight lid into which a small quantity of water (about one-thirtieth of its total capacity) is introduced as well as the material to be sterilized. This is completely immersed in glycerin, which is raised by a Bunsen flame or otherwise to a temperature of 115° to 116° C. and maintained at this for the requisite time, which is usually about half an hour. The apparatus is made in three sizes, the smallest taking a 1 c.cm. syringe, the second a large syringe or other instruments of corresponding size, and the third being intended for vessels containing solutions. A heating-bath is also available, intended chiefly for use with the largest size, in which a temperature of 115° C. is automatically maintained by the boiling and recondensation of a mixture of water and glycerin in certain proportions.

ELECTRIC HEATING PAD

An electric heating pad which would seem to have a variety of medical and nursing applications has been introduced into this country. A solidly constructed switch, so arranged that it can be altered with certainty by touch alone, is incorporated in a strong flex connecting the pad to the source of electric current. Four thermostats form part of the pad itself, and when the switch is turned to "low" the temperature of the entire pad is maintained at approximately 115° F. When the switch is at "high" the temperature is in the neighbourhood of 185° F., and with the switch in the "medium" position a temperature of 150° F. is maintained. The pad is of a convenient size, and is soft and flexible enough to conform comfortably to the contour of any part of the body to which it may be applied. The pad is known as the "Universal positive control automatic three-heat pad," and is obtainable from L. G. Hawkins and Co. Ltd. of 30–35, Drury Lane, W.C.2, to whom all inquiries should be directed.

BRITISH MEDICAL JOURNAL
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A MATERNITY SERVICE FOR NEW ZEALAND

Early last year the Government of New Zealand appointed a committee of inquiry into maternity services in that Dominion. Its report, which has recently been published, is worthy of attention here as well as in the country of its origin. Part I of the report—three-fifths of the whole—contains an extensive and careful survey of the available facilities for the supervision and conduct of maternity, district by district (forty-eight in all) throughout New Zealand, together with recommendations for making good such deficiencies as were found to exist. Part II, which includes a brief history of the development of maternity services in New Zealand from 1882 to 1937, is largely occupied with the discussion of more general questions. Four or five of these have an interesting bearing upon similar discussions here. It has to be borne in mind, however, that conditions are by no means identical in the two countries. In New Zealand distances are greater, transport is more difficult, and the population much more sparse; social customs differ in several respects, and the routine and distribution of medical practice are not quite the same. Moreover, there is only one university and medical school for the whole of the Dominion—that in Dunedin—and hospital administration is quite different from that in Great Britain. Though these considerations may easily and properly give rise to divergencies of view, the answers given in the report to certain questions may be of value in both countries. What should be the respective roles of the doctor, the midwife, and the nurse in any maternity scheme? Is hospitalization or domiciliary attendance at confinement the better method? Should the general practitioner be able to continue his attendance and responsibility while the patient is in hospital? How far is it desirable to make the relief of pain in childbirth a first consideration? How can the training of the midwife, the maternity nurse, and the medical man best be provided for? These are not, of course, the only questions dealt with in the report. Among others, the problem of domestic help and the Maori problem are considered, and there are clear indications that the committee would like to make the provision for maternity an integral part of a national health insurance system.

The committee wisely remarks that it is "not impressed with the arguments of those who contrast the midwife system at its best with the doctor service at its worst." It is more concerned to decide which system at its best offers the fullest advantages, and concludes that, "although the midwife system is giving a safe and efficient service, the combined system of doctor and nurse attendance can give a still more efficient and more satisfying service." Its unanimous opinion is that a doctor should from beginning to end be definitely responsible for each case, and should be available to attend during labour if sent for by the midwife or nurse in the event of any difficulty or abnormality. Further, with the exception of two of the medical members, who think that the proposal would not be feasible in many rural areas, the committee would require the doctor to attend at certain stages of the confinement whether sent for or not. It seems that already in New Zealand three-quarters of all cases are attended by both doctor and nurse, and, except in England, this method is tending to become increasingly that on which organized maternity services are based. Some 82 per cent. of the total number of confinements in the Dominion take place in maternity hospitals, and this percentage tends to increase. It is not surprising, therefore, that the committee favours institutional rather than domiciliary attendance. It regards the former as being on the whole more efficient and less expensive to provide, apart from capital charges. There are, however, provisos to these conclusions. Every hospital must be of the highest efficiency or it may become a danger. The hospitals must be graded and well placed. They are declared to be less expensive to maintain only in comparison with the services of two nurses and domestic help in the home of the patient, and not with those of the peripatetic midwife. The conduct of midwifery by the latter, the committee declares, would not be tolerated in New Zealand. A further condition of hospitalization—and this is of the utmost importance—would be that the general practitioner in attendance on the patient should be able to continue that attendance in the institution. The committee is emphatic about this on several grounds, and though (with the exception of the chairman) it would prefer a "close" staff for the larger hospital in each of the four cities—Wellington, Auckland, Christchurch, and Dunedin—which undertake the training of midwives as distinguished from maternity nurses, even there it would establish other hospitals in which the general practitioner would attend his own patients. Much attention is given in the report to the relief of pain in labour. Though the committee appears to think that in private practice more care is given to this in New Zealand

than elsewhere, it states that this is rare in the public hospitals, and the majority of the committee wish that there should be greater provision for it. This, indeed, is one of the reasons why it favours the attendance of a medical practitioner at each confinement, though it would be prepared to extend the powers of midwives and nurses to administer at least sedatives and analgesics under the direction of, though not necessarily in the presence of, a doctor.

The training of midwives, maternity nurses, and medical students in midwifery is sufficiently discussed for the purposes of the report. That there are difficulties and inefficiencies in such training is clear; and those relating to medical students appear to be much the same as in Great Britain. Though in some parts of the country it is essential that every practitioner should practise obstetrics, the process of partial specialization in such practice is proceeding in the Dominion as elsewhere. The committee wishes to facilitate and perfect this, for it does not think it well, even if it were possible, that maternity practice should be for the most part in the hands of the obstetrical specialist. Successful midwifery, it remarks, is not his prerogative: "It is a field in which the general practitioner may, and frequently does, excel; and it is on the men and women who have devoted time and means to the development of obstetrics as a branch of general practice that the safety, health, and happiness of the child-bearing woman must, in the long run, depend." Finally, there is one pronouncement on the economic aspect of the matter which will be welcomed by practitioners in this country. The committee is "satisfied that, taking into consideration the range of service involved, the responsibility and the exacting nature of the work, and the great additional demands of modern ante-natal and post-natal care, the medical fees in midwifery practice are moderate and in some cases quite inadequate. Thus, while the total costs when paid by the individual may appear considerable, the charges for the various items of the service are by no means excessive."

THE STATISTICS OF WAGES

In his very important book, *The Human Needs of Labour*, reviewed in our issue of May 22, 1937 (p. 1074), Mr. B. Seebohm Rowntree gave weighty reasons for thinking that the cost of supporting a family consisting of father, mother, and three dependent children and the cost of supporting an adult independent woman worker were data of fundamental sociological importance. By means of a careful statistical analysis he showed that, although the most frequent existing family was not of the size mentioned, when consideration was given to families of different sizes and to the difficulty of arranging family allowances, it was desirable to choose an over-all average in the way he had done. The interest and importance of the case of independent women workers hardly need a gloss. It follows that a computation of the numbers of male adults in occupations which do not enjoy average earnings equal to Mr. Rowntree's estimated minimum amount, and of the numbers of women employed in occupations not providing an average above the minimum for independent females, would be a useful addition to knowledge. We cannot, of course, say, because the average wages of, for instance, men aged 21 years or over employed in cotton weaving were 49s. 6d. a week in 1935, and Mr. Rowntree's minimum was 53s., that the whole population concerned—namely, these workers and their dependants—were necessarily underfed. Some of the workers may have had no dependants. Even if all were married men with families, some will have earned more than the average, unless every man earned precisely the same wage. But we can safely believe that, unless the composition of the population by age and civil state were extremely abnormal, an average wage below the minimum implies much hardship, to use no harsher term. Similar remarks apply to wage statistics of women aged 18 years and over; this group must include some who are not independent workers in Mr. Rowntree's sense.

Mr. Jürgen Kuczynski in his book *Hunger and Work*[1] has estimated the numbers of men and women in a large number of occupations whose average earnings do not reach the minima, and the results should be of definite value in sociological research. He has been obliged to base his calculations on sampling inquiries made by the Ministry of Labour, and allowance must be made for the incompletely representative character of the sampling, particularly the over-representation of large firms. Mr. Kuczynski's figures may well be taken as indices of unsatisfactory conditions, and from the census returns of occupied persons in 1931 it might be possible to obtain weighting factors to allow for differences in age composition and proportions of married men in different occupations. Mr. Kuczynski has in fact provided further data of value in a complete study of the condition of England. Mr. Kuczynski himself thinks he has done more: that he has proved that "10,000,000 working men, women, and children are living under such conditions that they cannot even keep fit for work, they are not able to recuperate completely from the exhausting work half

[1] *Hunger and Work: Statistical Studies.* By Jürgen Kuczynski. (London: Lawrence and Wishart. 3s. 6d.)

of them are continuously doing, and they have to spend more strength than they can get back through the purchasing power they earn." This estimate is, we think, little more than guesswork; in spite of a friendly hint from a trade union official that an average is, after all, an average, Mr. Kuczynski is emotionally convinced that, if one assumes that all persons in groups whose average earnings are below a certain minimum earn less than that minimum, the error is compensated by neglecting the numbers of persons in groups earning on the average more than the minimum who receive less than the group mean. Those who cannot share this faith may be tempted to dismiss the book as mere rhetoric. It does indeed contain much very bad rhetoric. But, if we use the arithmetical results as *indices*, they are significant contributions to knowledge and deserve most careful scrutiny. Medical readers should have no difficulty in separating the wheat from the chaff.

UNEXPECTED SCURVY

A revival of interest in Antarctic adventures—perhaps stimulated by the republication last year of Mr. Cherry-Garrard's *The Worst Journey in the World*—brings to the fore once again the problem of what part scurvy played in the final tragedy of March, 1912. It seems almost unbelievable in these days, when vitamin C can be easily synthesized, that in August, 1911, Dr. E. L. Atkinson, surgeon to Captain Scott's last expedition, could express the view that the cause of scurvy was tainted food, producing "acid intoxication." Yet knowledgeable as the public and the medical profession have now become about the cause and cure of scurvy, the disease still occurs in unexpected ways, as Dr. G. H. Jennings and Surgeon Lieutenant A. J. Glazebrook—it is appropriate that the Navy should still display interest in this disease—record elsewhere in this issue (p. 784). It is realized that single men living alone, often with dietetic habits that are peculiar from choice or necessity, may become scorbutic, and there is a similar risk in the dietetic regime prescribed in the treatment of peptic ulcer. But both patients described by Dr. Jennings and Surgeon Lieutenant Glazebrook were married men with devoted wives. It is particularly interesting that one patient, whose wife had for years carefully limited his vitamin C intake, was able to take fruit juice with a certain amount of relish when his tissues had become saturated as a result of massive dosage with ascorbic acid. "The clinical features in these cases were, of course, quite typical," state the authors, but perhaps this is wisdom after the event, for a study of the case records and details of treatment of Case I shows clearly that the combination of a megalocytic anaemia, bone marrow hyperplasia, and achlorhydria led to a provisional diagnosis of pernicious anaemia. After liver therapy had failed, the finding of occult blood in the stools suggested a neoplasm. It was only when further spontaneous haemorrhages into various parts of the body occurred that the diagnosis of scurvy was made. The response to ascorbic acid was dramatic, full saturation of the tissues being obtained after three weeks with 14 grammes of ascorbic acid in all. The second patient, after escaping scurvy in over twenty years at sea on long voyages, despite his seemingly satisfactory home conditions, appears to have drifted into a dietetic programme which was grossly deficient in vitamin C. Here the diagnosis was prompt and the treatment completely effective within about a month. Besides serving as a reminder that scurvy must still be considered in the differential diagnosis of obscure anaemic and haemorrhagic states, this contribution also usefully analyses the various diagnostic aids available. But even if these give some indication of the degree of vitamin C deficiency present they would not appear as valuable in the absolute diagnosis as a history of a scorbutic diet and the effect of treatment, now happily possible in a simple and concentrated form. With tablets of ascorbic acid available in 1912, Polar history might have contained one more happy ending.

SEEPAGE IN POROUS SOILS

In view of the importance attached to the possible pollution of water supplies by seepage the experiments recently carried out by members of the Field Research Laboratory of the Alabama State Department of Health[1] are worthy of close attention. These experiments, conducted with extreme care, were fostered by the Health Division of the Rockefeller Foundation, and although the results in many respects run counter to preconceived notions and commonly accepted statements they are not on that account alone to be lightly set aside. The object of the present investigation was to determine over a prolonged period the nature, course, and characteristics of the seepage flow from a pit latrine situated in porous (sandy) soil in a river valley, and it was in fact a continuation of similar previous studies.[2] The experimental source of pollution was a privy pit constructed to bottom in about a foot of ground water and used continuously by a family of nine persons. The results of elaborate investigation of the physical, chemical, and bacterial characteristics of the surrounding soil having previously been recorded, concentric arcs of small tube wells were made around the pit, from which samples of the ground water were drawn for analyses. Contrary to current theory, it was found that traceable pollution did not travel radially in all directions but formed a diminishing "tail" in the direction of the ground-water flow with practically no extension up-stream, and, further, that the bacterial stream formed a defined cone within the chemical stream of less diameter and much less length—roughly about one-tenth. The tracing of faecal organisms was made the subject of special study, and it was found that the anaerobes (for example, *Cl. welchii*) penetrated much further than the aerobes—up to fifty feet—while the *B. coli* were not found beyond ten feet, and laterally not beyond

[1] *J. infect. Dis.*, 1938, **62**, 225.
[2] Ibid., 1937, **61**, 148, 270.

five feet. The suggestion offered in explanation of the curtailment of the bacterial cone is that the organisms do not penetrate by growth in the soil but are mechanically carried in the flow. In time the soil in their path becomes clogged by gelatinous material, which forms an effective barrier, the process, in fact, being comparable to the "ripening" of a bacterial filter. At all times the pollution flow was found to be enveloped by fresh water. At times it would "swing" laterally with oscillations of the ground-water flow, increasing in width owing to lag and becoming correspondingly more shallow, but tending always towards its former shape. In a supplementary investigation the vertical seepage from a privy pit on top of a cliff face was undertaken, and here again the spread of pollution was remarkably limited. If the pit was kept dry, faecal organisms could not be found at one foot below; if it was exposed to saturation by rain *B. coli* were found at three but not at four feet; and if the pit were flooded with water (100 gallons daily) the distance was extended to six but not to seven feet. The lateral spread in all these cases was insignificant, amounting to not much more than a foot either way—that is, the pollution flow was steeply dome-shaped. By keeping the pit flooded with water for a prolonged period the progressive clogging effect could be demonstrated as well as the shortening of the penetration distance of the faecal organisms, the maximum penetration being observed after two months' use. It is claimed that these investigations demonstrate an important principle not heretofore developed—namely, that a pollution stream describes a path which is the resultant of the interacting forces of lineal flow with the ground water toward the discharge stream, and of variations in densities of the effluent flow in comparison with the ground water.

MALARIA THERAPY

A useful summary of the arrangements made by the Ministry of Health for malaria therapy is given in *A Report on the Provision and Distribution of Infective Material for the Practice of Malaria-Therapy in England and Wales*.[1] A scheme was initiated in 1923, and within two years the requests for infective material became so numerous that the Ministry of Health, in consultation with the Board of Control, the London County Council, and the authorities at Horton Mental Hospital, decided to establish a unit consisting of a treatment centre and a malaria laboratory at Horton. There, apart from treatment of cases and provision of material for treatment in other centres, research on malaria therapy has been steadily continued. Various strains of all the species of human malaria and also *P. knowlesi* have been investigated, but the "Madagascar" strain of *P. vivax* is usually employed for routine purposes. This strain has several advantages: it produces large numbers of gametocytes, making it easy to infect mosquitos; mosquito transmission is very certain; the incubation period of the induced fever is relatively short (about ten to fourteen days) and shows little variation; few patients in England are resistant to infection with this strain; and the infection, although vigorous, with proper care is not unduly dangerous. Other species of *Plasmodium* are used for patients who do not develop satisfactory infections with the routine strain or have acquired immunity to *P. vivax*. The detailed descriptions of standardized procedures which have been developed for the breeding, maintenance, and infection of mosquitos will be of value to all who are working in this field. The general reader will be most interested in the arrangements that have been made for the treatment of cases outside the unit. On request, infected mosquitos are sent with a trained assistant where possible. Usually, however, infective material is supplied in the form of defibrinated infected blood, which is dispatched in small ampoules, packed in ice if the journey is likely to take more than eighteen hours. Any objection to infection by blood probably rests upon theoretical rather than practical grounds. A small record card is supplied, which the doctor in charge of the case is asked to complete and return in due course to the Ministry of Health for research analysis. Advice, if asked for, will be given during the course of treatment and blood films will be examined for parasites free of charge. The report contains a table which records the results of treating between five and seven hundred cases of general paralysis of the insane yearly since 1927. Over 50 per cent. had some favourable result, about 15 per cent. being discharged "cured" and almost 10 per cent. being discharged "improved." The conclusion is that the method at present offers one of the most satisfactory forms of therapy for sufferers from this disease, but the report does not concern itself with the mechanism of the therapeutic action or with any comparison of other methods of inducing pyrexia. The opinion is expressed that if malaria therapy is applied in a sufficiently early stage of the disease the patient will usually recover and be able to return to normal life again; but even if applied later it is found that in a large proportion of cases the expectation of life is increased, and, though institutionalized, many patients will show definite mental and physical improvement. It is to be hoped that the convenient arrangements now existing for this treatment are being fully utilized.

[1] Reports on Public Health and Medical Subjects. No. 84. H.M. Stationery Office. Price 6d. net.

CAUSES OF BLINDNESS

An excellent piece of work is embodied in the thirty-second annual report of the Northern Counties Association for the Blind, a body which covers Yorkshire, Lancashire, Northumberland, Durham, Cumberland, and Westmorland in endeavouring to promote the welfare of the blind and prevent blindness. The medical subcommittee, of which Dr. Kay Sharp, consulting ophthalmic surgeon, West Riding County Council, is chairman, has analysed 10,000 cases of blindness with a view to ascertaining the causation. The classification follows the sections of forms B.D. 8 and 37 D, which are used now by all the forty-six authorities in the

area. Of the 10,000 cases, 6,406 were found to be due to congenital or undetermined causes, primary cataract accounting for more than one-half, and primary glaucoma for one-sixth. The number of cases due to infectious and bacterial causes was 1,791, of which 405 were ascribed to ophthalmia neonatorum, and 492 to syphilis, congenital or acquired. The cases of blindness due to traumatic and chemical causes numbered 580, industrial trauma accounting for 262, and non-industrial (including 44 relics of war injury) for 286. Under "general diseases" 800 cases of blindness are listed, the largest subsection being vascular diseases, including cerebral vascular lesions, and the next largest diabetes. Of the 10,000 cases, no information as to cause was obtainable in 423. The number of females was slightly in excess of the number of males in all categories except the traumatic; in that category there were nearly four times as many males as females. The classification will form the basis of the work of the subcommittee during the coming year, when the information contained in it will be further elaborated. Another piece of work on which the subcommittee is now engaged is the production of a film for projection in schools, factories, and workshops with a view to preventing blindness.

RESPIRATION AND ANAESTHESIA

The present state of knowledge as to the regulation of respiration, with particular reference to anaesthesia, has recently been reviewed by Schmidt.[1] During normal respiration only the muscles of inspiration—namely, the diaphragm and external intercostals—are active. Their nerve centres in the medulla have the lowest threshold for chemical stimuli, and function under resting conditions, but are the most resistant to depressant drugs and other influences. Thus, in deep anaesthesia or depression due to drugs, respiratory movements may be reduced to a series of inspiratory gasps—a warning of impending respiratory failure. The Hering-Breuer reflexes from the lungs, which control inspiration and expiration, provide a factor of safety in ether anaesthesia, for the irritant action of the vapour leads to violent expiratory efforts and more complete emptying of the lungs. These efforts reflexly cause an increase in the rate and depth of respiration, which may thus be maintained at a normal level in spite of severe depression of the respiratory centre. With increasing narcosis the depth of respiration decreases, but the rate of breathing is maintained until expiratory paralysis and slowing of the rate indicate a dangerous degree of depression. The respiratory centre is also affected by other nerve impulses and by chemical stimuli, while its proper functioning depends on adequate oxygenation. It is very sensitive to changes in hydrogen ion concentration, and normally responds promptly to changes in the carbon dioxide tension of the blood—the ordinary regulator of respiration. Lack of oxygen alone acts merely as a depressant, and the stimulating effect of anoxaemia is due to afferent nerve impulses from specialized receptors in the carotid bodies and aorta; these impulses are quite distinct from the reflexes arising in the carotid sinuses and aortic arch, which mainly control the heart rate and blood pressure. The carotid body appears to be adapted for the transformation of chemical changes in the blood into nerve impulses to the respiratory centre. These reflex impulses are more resistant than the centre itself to depressants, so respiration may be continued through the stimulus of anoxaemia although the centre fails to respond directly to the stimulus of increasing carbon dioxide. Under such conditions respiration may fail entirely when the anoxaemia is relieved by the administration of oxygen, but this risk must be taken, for continued anoxaemia implies prolonged and possibly permanent damage to the brain and heart, and it may be particularly dangerous when combined with depression caused by drugs. The hyperpnoea brought about by lobeline, cyanides, etc., appears to be due to reflexes from the carotid bodies. Though carbon dioxide is a powerful stimulant to the normal respiratory centre, it may act as a depressant when the centre is heavily narcotized, due to a direct narcotic action, or by increasing the centre's demand for oxygen when its supply is barely adequate, or, if given with oxygen, by removing an anoxaemia which was reflexly maintaining respiration. The recovery of a patient with extreme depression of breathing resulting from narcotics depends less on the administration of respiratory stimulants than on (1) removal of the drug from the brain, and (2) maintenance of oxygenation. The former is facilitated by improving the cerebral circulation, by transfusion, etc., and also by lowering the cerebrospinal fluid pressure by the intravenous infusion of hypertonic sucrose (50 per cent.) solution; glucose or saline infusions may increase the cerebrospinal fluid pressure. The value of the usual stimulants—strychnine, caffeine, camphor, coramine, picrotoxin, etc.—is questionable, for they have little effect on the severely depressed cent . Lobeline is probably the best stimulant, but its action is transitory and may be followed by depression; it is not indicated when the breathing is weak or absent in the presence of severe cyanosis, for the cyanosis shows that the centre is too depressed for reflexes from the carotid body to be effective. The increasing incidence of asphyxia neonatorum in recent years is probably due to the greater use of non-volatile narcotics during labour. The foetal brain is normally in a state of anoxaemia, and is thus unduly sensitive to depressants; where possible volatile agents which are rapidly excreted should be used. Asphyxia is best treated by insufflation of oxygen by means of a tracheal tube; carbon dioxide should be added not for its stimulant effect but to prevent undue depletion of its tension in the blood.

[1] *Anesth. & Analges.*, 1938, **17**, 24.

The Semon Lecture, entitled "Laryngology's Debt to Research," will be given by Mr. W. M. Mollison at the Royal Society of Medicine, 1, Wimpole Street, W., on Thursday, November 3, at 5 p.m. The lecture is under the auspices of the University of London, and the chair will be taken by Mr. C. A. Scott Ridout, president of the laryngological section of the Society.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

INFECTIONS OF THE HAND AND FINGERS—III

BY

NORMAN C. LAKE, D.Sc., M.D., M.S., F.R.C.S.

Incisions

Infection of the pulp of a finger is best dealt with by an incision that skirts the end of the finger about one-eighth of an inch from the nail margin, which it follows. The whole pulp is raised as a flap from off the periosteum of the underlying bone (Fig 6, *a*). The wound is kept wide open by packing the interval with gauze soaked in a suitable antiseptic, such as 1 in 1,000 flavine. In this way all the loculi previously described are drained, as this incision cuts across the bases of them all. The spread of infection is thus arrested, and the bone, unless already involved, is saved. When the infection has been overcome the flap falls back readily into position with an intact

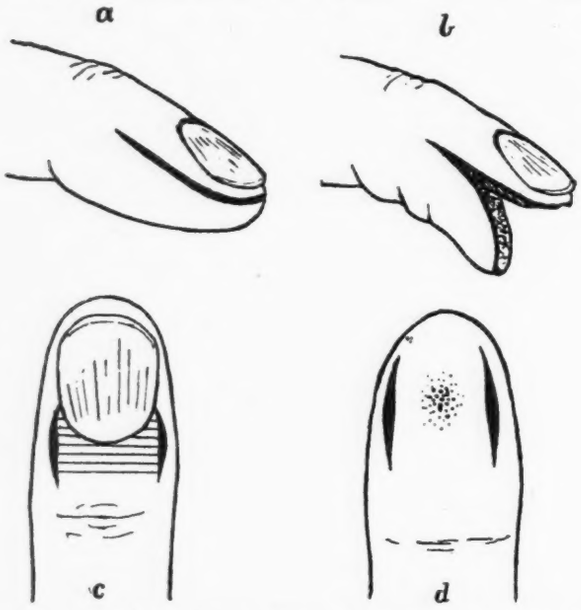


FIG. 6.—Incisions for drainage of infections of terminal phalanx. (*a*) Incision for draining pulp. (*b*) Flap turned back. (*c*) Flap to be turned back for drainage of infection of the root of the nail. (*d*) Transfixion incision for drainage of central pulp infection.

nerve and blood supply; the final scar is obviously well removed from all pressure points. In some cases half only of the flap is raised: this is especially useful when one side of the nail groove is involved. Exceptionally, a central infection of the pulp may be treated by a transfixing incision extending from one side to the other (Fig. 6, *d*).

Infections under the nail are best dealt with by removal of that structure, either wholly or in part. For central infections of the nail bed it is sometimes recommended that a small trephine hole be made through the underlying nail, but this is apt to provide very inadequate drainage, and in the long run little time is saved over the more certain removal of half or the whole nail. When the root of the nail is involved, as in onychia, two lateral vertical incisions are made, continuing the line of the lateral nail groove for about half an inch (Fig. 6, *c*). The whole skin flap thus outlined is raised off the nail root and packed as above. Multiple chronic infections of the nail groove are not uncommon. In some cases there may be a general syphilitic or tuberculous infection; in others, infection is due to a ringworm; but in a third variety, of increasing frequency, manicuring is to blame. For this group in the earlier stages local antiseptic applications, especially those having great penetrating powers, are advisable. Ultra-violet light has also proved effective in many instances, but for those intractable cases where,

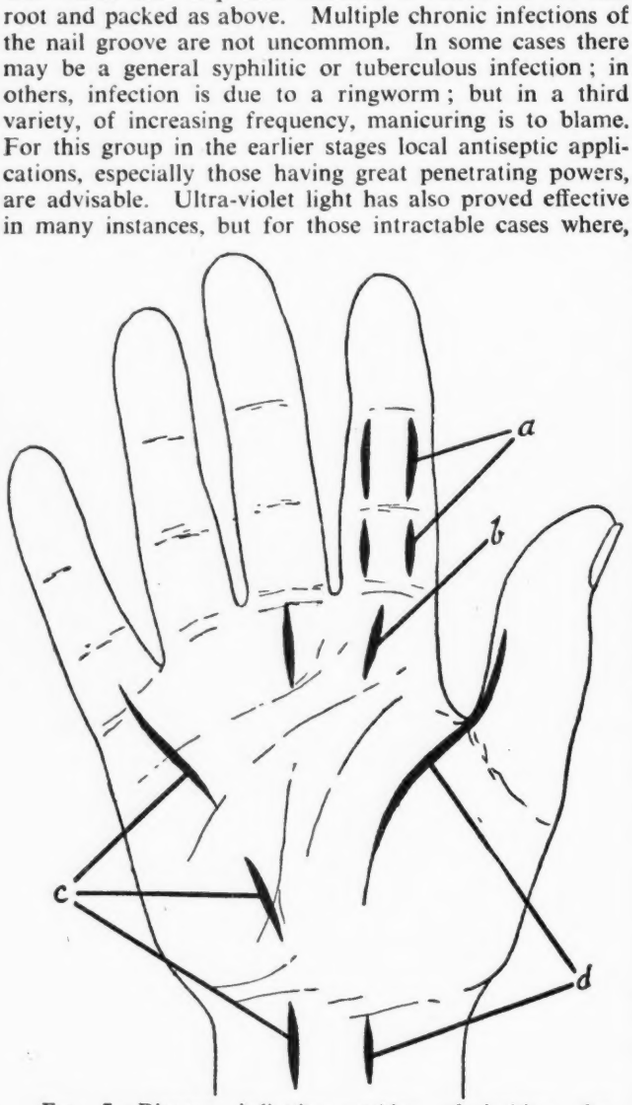


FIG. 7.—Diagram indicating position of incisions for drainage: (*a*) of digital thecae, (*b*) of proximal end of digital thecae, (*c*) of ulnar bursa, (*d*) of theca of thumb.

owing to reinfection or lack of resistance, the condition fails to respond to other methods, removal of all the nails may prove the quickest method of clearing up the infection.

Infections in the intermediate and proximal sections of a digit are drained by lateral incisions which avoid the nerves and vessels by keeping well on to the palmar aspect. These incisions into the subcutaneous tissues may cross the skin creases with impunity. Drainage of the thecae is a much more difficult problem. If the whole length of a theca were to be opened by a median incision an adequate drainage would undoubtedly be established, but the tendons would retract out of the wound like a "bow-string." It is true that this might be avoided by splinting in complete extension, but dense anterior adhesions would form which it would be impossible to break down subsequently. In addition the sheath would

be weakened at its most important part and the scar would be right over the pressure area. For these various reasons the incisions are usually made in a bridged fashion (Fig. 7, *a*) leaving the intervening portion of the theca intact. They are placed at the lateral borders of the sheath, but carefully avoid the digital nerves and vessels. With these provisos the incisions should be made as extensive as possible.

The extension of a theca into the palm may be drained by a median incision (Fig. 7, *b*); care is necessary, however, in the case of the index finger to avoid the nerves and vessels which cross it (see anatomical section, Fig. 3).

There is some divergence of opinion as to the best position into which to fix a finger in these cases. If the theca is not divided in its whole length there is little fear of tendon prolapse, and a somewhat flexed finger is much easier to manipulate than one which is fully extended, so that any subsequent adhesions can be more easily dealt with. Difficulties may arise when it has been impossible to say before operation whether the theca is involved. In these circumstances the surgeon should first dissect carefully down to the theca. If it is obviously infected it can then be opened; if it is doubtful the wound may be left wide open and a fresh observation made in twenty-four hours. In exceptional cases the discreet use of a needle and syringe may decide the issue, but the greatest care should be taken not to introduce infection in so doing.

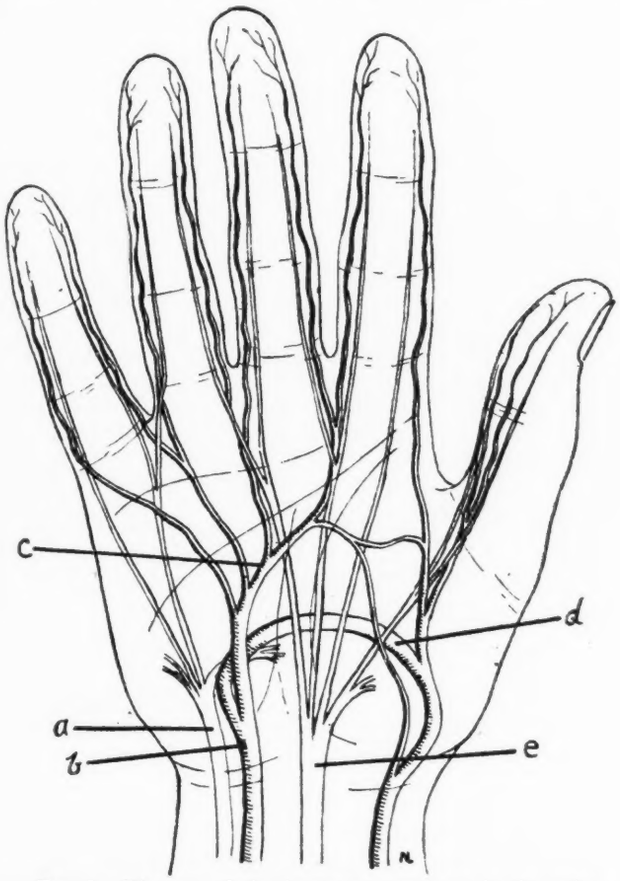


Fig. 8.—Diagram of the important structures in the palm. (*a*) Ulnar nerve. (*b*) Ulnar artery. (*c*) Superficial palmar arch. (*d*) Deep palmar arch. (*e*) Median nerve.

Drainage of the Palm

A glance at the anatomical diagrams (Figs. 8 and 9) will indicate that infections in the palmar spaces could not be approached directly through the palm without grave risks of damage to important structures. The routes by which these infections spread naturally have already been outlined, and it is along this same track that the surgeon should attempt their drainage. The incisions are therefore made in the appropriate web spaces, and, from these, sinus forceps are carefully pushed into the deep spaces until pus is reached. The operator must visualize the position of these spaces in so doing. Drainage may be maintained by keeping the tracks open with strips of thin glove rubber. No drainage tube should be used owing to the great risk of causing pressure necrosis and secondary haemorrhage. In view of what has already been said on this subject in previous paragraphs there should be no need to warn the unwary against making incisions into the swollen tissues on the dorsum of the hand.

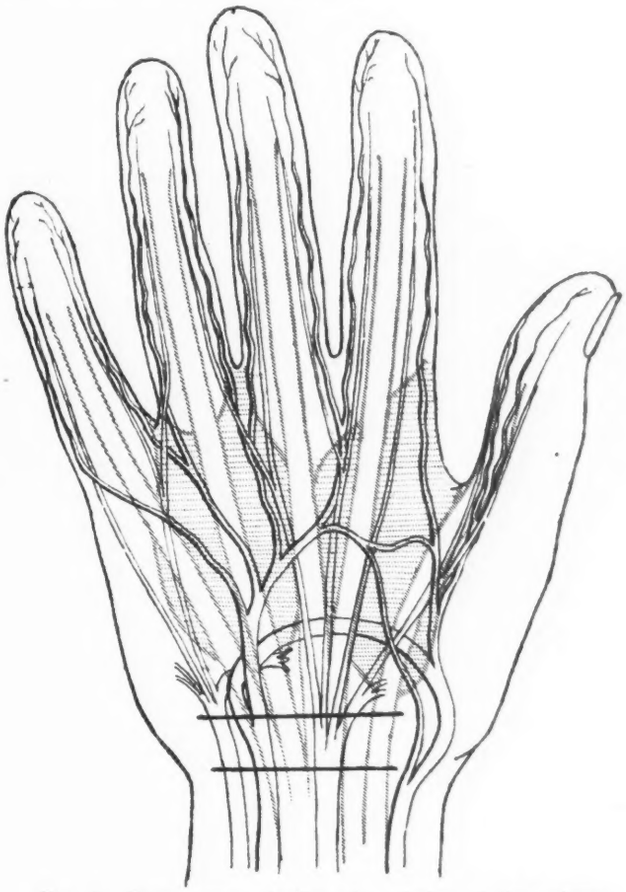


Fig. 9.—Transparency showing the relation of the palmar and thenar spaces of Kanavel to the chief overlying structures. The horizontal lines represent the limits of the anterior annular ligament.

The proper drainage of the theca of the thumb and of the main palmar bursa demands a rather high degree of skill, otherwise considerable damage may be done to the important structures which are crowded together in this region. These thecae may be approached through the lateral and medial extensions of the palmar fascia, which are much thinner and less important than the central portion. Before dealing with these cases the operator should review the anatomical diagrams (Figs. 4 and 9). The incision for drainage of the thumb theca skirts the inner margin of the thenar eminence. The sheath is first opened in its distal portion, where it is easy to find, and is then followed upwards towards the wrist. Part of the vascular and sensory nervous supply to the thumb crosses the sheath, and should if possible be

preserved. In any case the incision must not extend so far proximally as to endanger the motor nerve supply of the thenar muscles from the median. The proximal end of this bursa may, however, be drained in the forearm immediately above the annular ligaments (Fig. 7, *d*).

The common palmar bursa and its extension to the little finger is drained by an incision which follows the ulnar border of the sheath. Part of the sensory nerve supply of this digit crosses the sheath and may perforce have to be sacrificed. The incision must be strictly limited proximally to avoid damage to the ulnar nerve, but the proximal end of this bursa may be drained in the forearm, as in the case of the thumb (Fig. 7, *c*). The deep space of the forearm, which may become infected by extension from the palmar space and which lies deep to the tendons and their bursae, is drained by medial and lateral incisions which approach the space from both aspects; the superficial structures are retracted forwards.

Involvement of bones will be very largely avoided if early and adequate drainage of more superficial infections is instituted. Bone infection, especially of the terminal phalanx, may be suspected if the wound or sinus does not readily close, if the finger remains swollen, or if fresh abscesses and sinuses form. The use of a probe will reveal a necrotic bone, and in these cases, although not in the initial stages of bone involvement, a radiograph is of great value. At the earliest possible moment the cavity should be laid freely open and all necrotic bone removed. It has already been mentioned that the terminal joint and the tendon sheaths usually escape. The final result following necrosis of the terminal phalanx, when the soft tissues have not been allowed to become extensively destroyed, is good.

Necrosis of the long flexor tendons is a serious outcome of infection. This sequel could be very largely avoided by the early recognition and energetic treatment of infections by operation. Efficient drainage of a sheath as soon as it becomes infected, followed by splinting of the digit, allows adhesions to form between the tendon and the sheath, which limit the further spread of the process. These adhesions are usually thin, and can be easily broken down subsequently. For the reasons already given, if the sheath be not drained early the tendon will surely undergo necrosis and the function of the finger be thus destroyed. A dead tendon must be removed, since it is otherwise a source of prolonged suppuration, and there is nothing to be gained by its retention. At a later date the question of a plastic operation or of amputation of the digit will have to be considered.

Infection of joints is luckily uncommon, at least until the general condition of the digit has become so serious that there is little hope of retaining it. In the rare examples of solitary joint infection the condition is recognized by the localization of the swelling and the immobility of the joint concerned. As in the case of joint infections elsewhere, incisions are made down to and through the capsule, but no drainage material is allowed to enter the joint cavity.

It remains to consider the value of hot baths, Bier's congestive bandages, etc., in the treatment of these cases. Many have great faith in the value of hot arm baths with various antiseptics, and in cases where adequate drainage has already been established there may be some virtue in the method. Frequently, however, the use of these measures leads to procrastination in dealing with the spread of infections by surgery, and in these circumstances they are to be condemned. Hot baths, etc., must never be allowed to replace surgical drainage; but there may be little harm, and possibly equally little value, in using them after such drainage is established. Occasionally, if the edges of an incision tend to become encrusted with discharge which prevents free drainage, a bath of weak flavine, eusol, or milton may be used, but it should be repeated with caution lest the skin become sodden.

The application of a Bier's congestive bandage appears at times to be of some value, but it must not be expected to replace surgical measures. It may be used both in the very early stages to help localization, and later, after drainage, to flush the wound with serum and assist free discharge.

The treatment of the chronic infections previously mentioned falls outside the scope of this article.

Prophylaxis

Finally a word must be said concerning prophylaxis. It has been pointed out that many of these cases arise from wounds and injuries, so that, except for certain difficulties already considered, it would appear feasible to prevent the complication of infection in a large number of them. In the hand, with its anatomical complexity and the contraction and retraction of structures after division, immediate complete sterilization of the wound will very often prove impossible. It is therefore frequently an error to attempt immediate closure. The wound should be left wide open, after a preliminary cleansing, and packed lightly with some suitable antiseptic gauze. After a few days a secondary suture may be attempted without fear of gross infection. Divided structures of importance may have an identifying suture passed through them, to prevent retraction and to aid recognition at the secondary suture. Punctured wounds—for example, those produced by needles—present a special problem in prophylaxis. If the penetration is known to be of very limited extent, it may be proper to attempt sterilization by the passage, along the track, of the eye end of a needle dipped in carbolic. In most cases, however, it is wise to avoid the use of strong antiseptics and to rely upon suction or the use of a congestive bandage above the part for twenty-four hours or so.

LISTER AT UNIVERSITY COLLEGE AND HOSPITAL

ADDRESS BY SIR StCLAIR THOMSON

At a reception held at University College Hospital on October 11 Sir StClair Thomson, who was house-surgeon to Lister in 1883, delivered an address on Lister at University College and Hospital.

Sir StClair said that University and King's Colleges had only recently celebrated their first centenary and both could rejoice in cherishing the memory and example of the greatest of all the masters of surgery, for Lister felt the first impulse towards his great life-work in University College Hospital, and this reached its fruition during the sixteen years that he worked in the wards of King's College Hospital to demonstrate the truth of his principles. Lister was a "true-born Englishman." His people came from Yorkshire. His father was a wine-merchant in the City of London, and had a love of learning and a taste for scientific pursuits, for he was deeply interested in the science of optics, helped to perfect the microscope, and was a Fellow of the Royal Society. He was also a good classical scholar and skilful both with his brush and pencil. Moreover he was a Quaker, and Joseph Lister grew up in the atmosphere of that rather serious-minded sect.

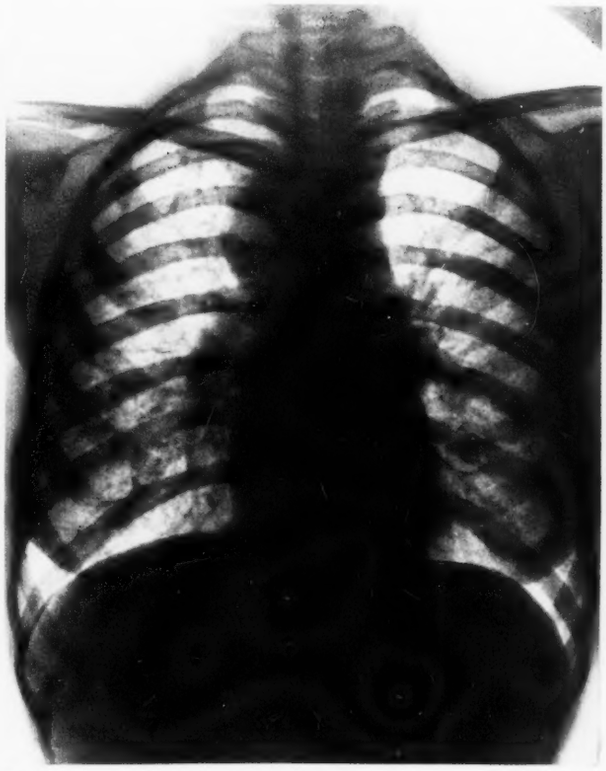


FIG. 1.—Case V. Radiograph of chest showing enlargement of mediastinal and hilar lymph-nodes.

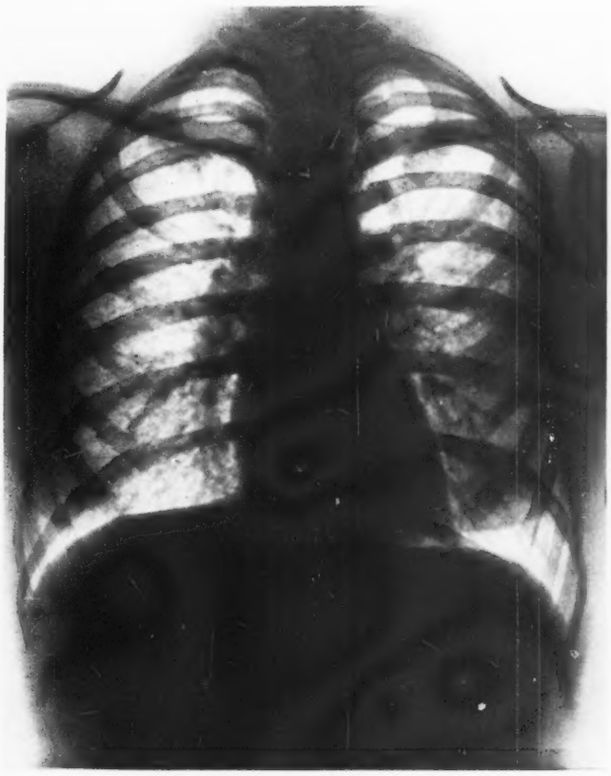


FIG. 2.—Case VI. Radiograph of chest showing enlargement of hilar lymph-nodes with the miliary type of sarcoid lesion.

FIG. 3.—Case I. Radiograph of chest showing diffuse pulmonary fibrosis.

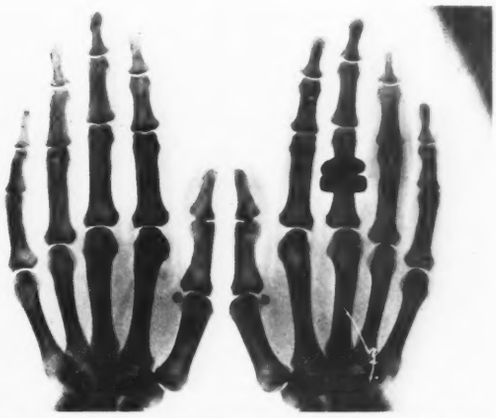


FIG. 4.—Case VIII. Radiograph of hands. Changes of osteitis multiplex are seen at distal end of proximal phalanges of left thumb and third finger and right third finger.

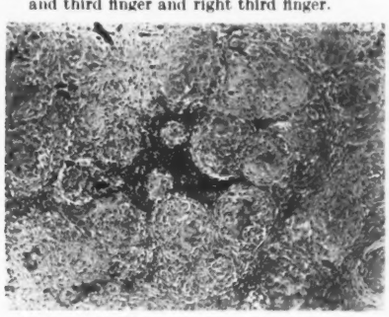


FIG. 5.—Case IV. Photomicrograph of lymph-node showing changes of sarcoidosis.

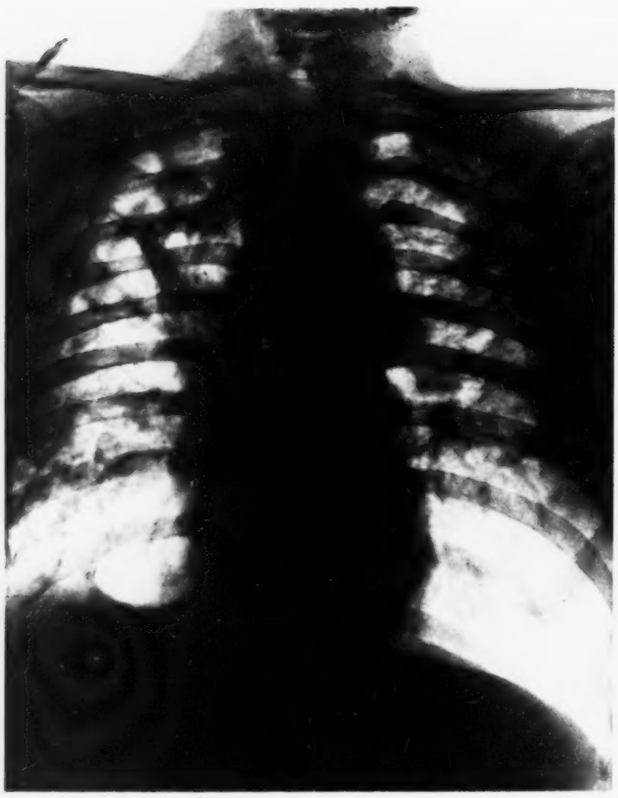


FIG. 1A.—Ordinary radiograph of chest of Case I. Lesion fibrotic and bilateral.

FIG. 1B.—Tomogram of Case I taken at level of 5 cm. from back of chest.

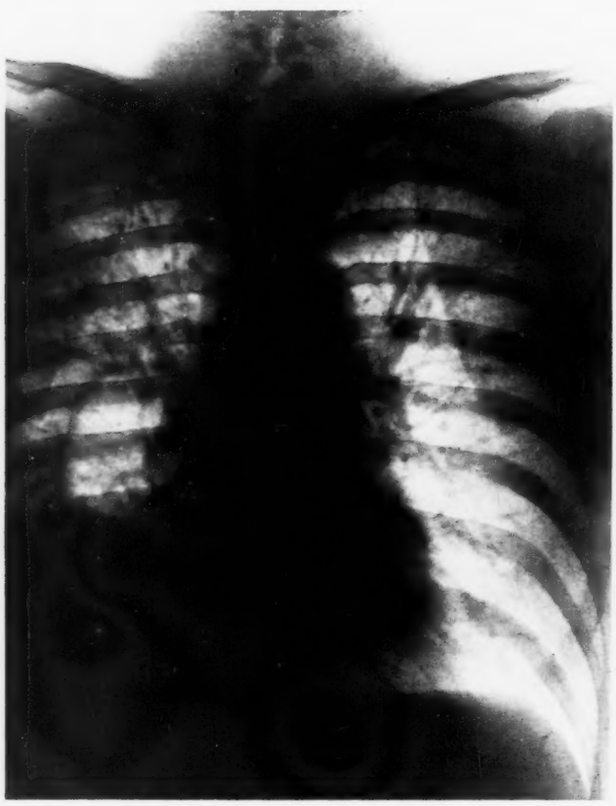


FIG. 2A.—Ordinary radiograph of chest of Case II.

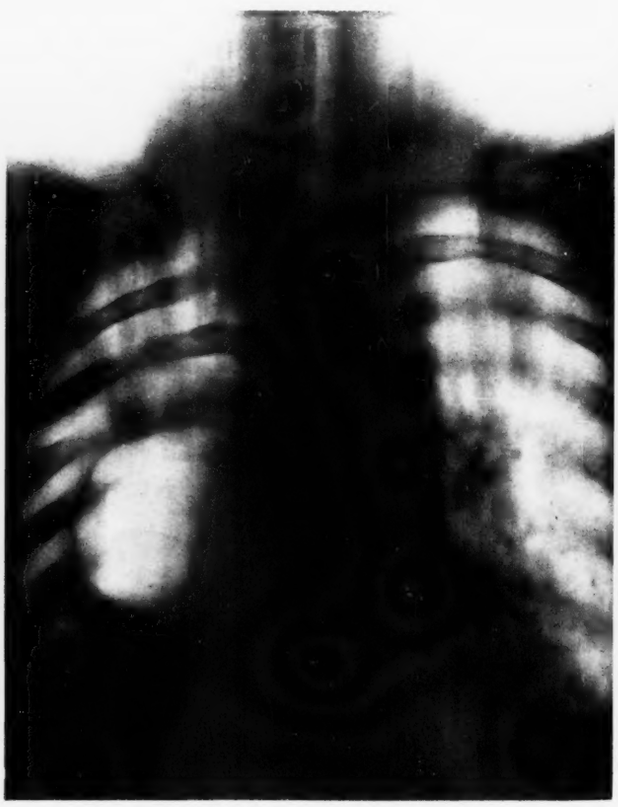


FIG. 2B.—Tomogram of Case II taken 5 cm. from back of chest. Large cavity in right lower lobe now obvious.

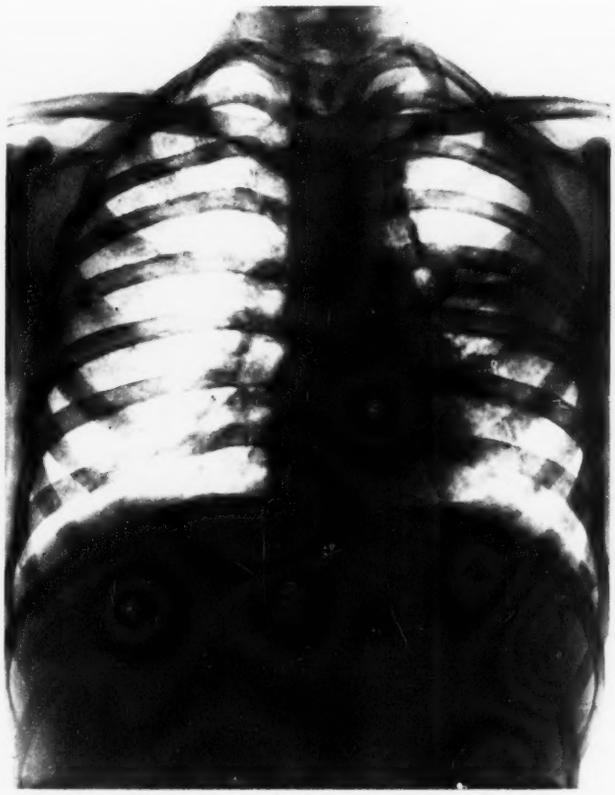


FIG. 3A.—Ordinary radiograph of Case III taken in the erect position.

FIG. 3B.—Lateral tomogram of the left lung of Case III taken in the plane of the mid-clavicular line.

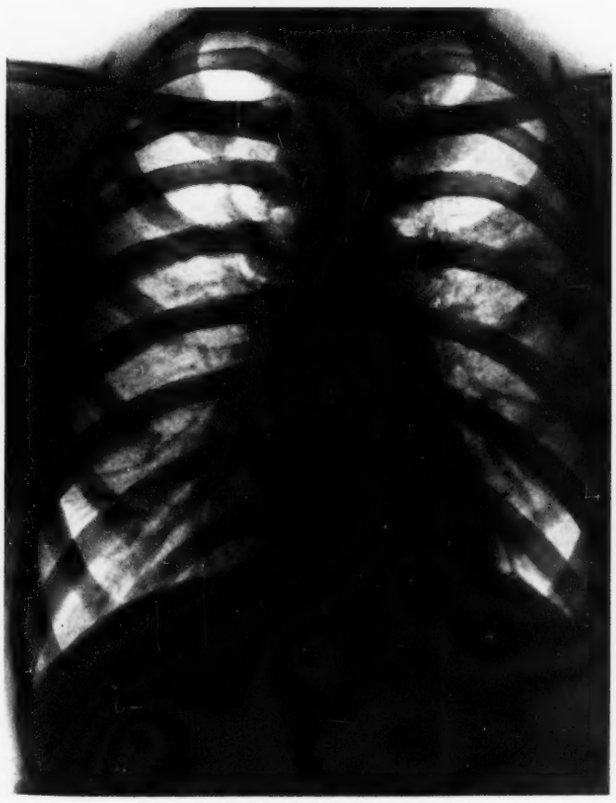


FIG. 4A.—Ordinary radiograph of Case IV.

FIG. 4B.—Median tomogram of Case IV, taken midway between front and back of chest.

FIG. 1.—Case I. Adult scurvy, showing extensive extravasation of blood in right popliteal fossa and posterior part of thigh.

FIG. 2.—Case I. Extravasation of blood around right ankle and on right shin. Some oedema of foot.

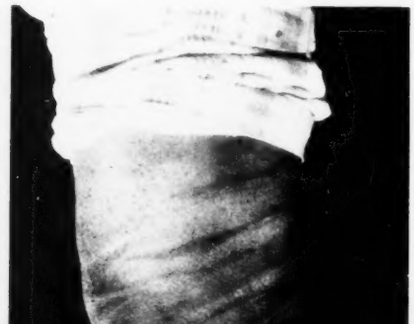


FIG. 3.—Case I. Showing swelling of left knee with peri-articular and popliteal extravasations marked by tight bandage. Petechiae into hair follicles.

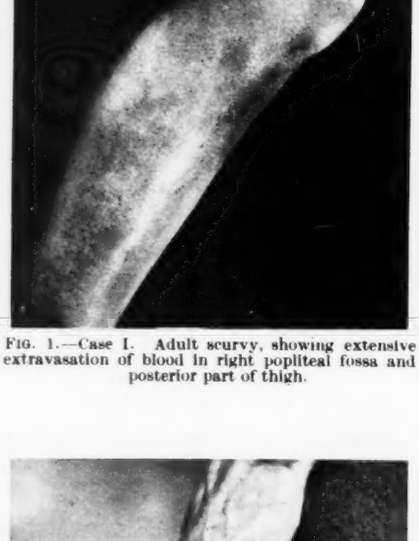
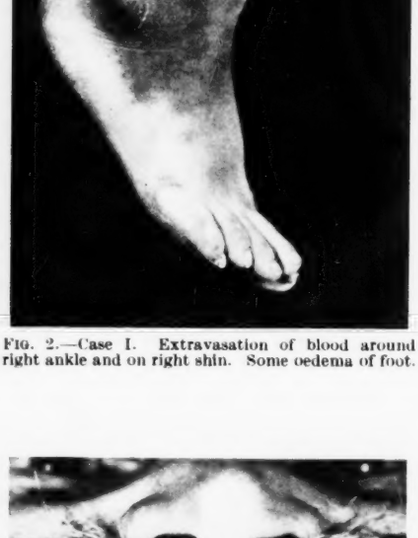
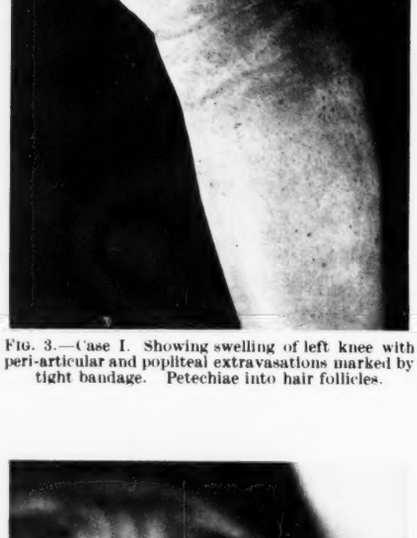


FIG. 4.—Case II. Forearm with bleb-like extravasations of blood resulting from slight traumata a year previously. Result of a recent tourniquet test also seen.





FIGS. 5 and 6.—Case II. Gums of upper and lower jaw showing considerable swelling and discoloration.

Lister's Student Days

Being debarred from Cambridge and Oxford, Lister entered University College in the spring of 1844 at the age of 17. The College had been founded recently as a non-sectarian institution, just as King's College was started a few years later to maintain the tenets of the Church of England. Lister, a Quaker, began his long life of study in the one college and finished it in the other, having on his marriage at the age of 29 joined the Church of England. He bequeathed £10,000 to King's College Hospital and exactly the same amount to University College Hospital—nearly one-third of his fortune. The remainder of his fortune—not a large one—was all, except a small amount, left for public use.

Three years were passed at the College in taking the degree of B.A. Apparently these were not the happiest of his life. During this period Lister was described by a junior fellow-student as "rather dwelling apart and not making any strong fellowship with his fellows." He had an attack of small-pox, reurned too soon afterwards to his studies, and then had a serious nervous breakdown which necessitated a long holiday.

Lister was 20 years of age when he entered the medical department in 1848, and was fortunate in coming under the care of such eminent teachers as Lindley, teacher of botany; W. B. Carpenter, of medical jurisprudence; Graham, of chemistry; and Ellis, of anatomy. Another well-known teacher was Wharton Jones, who, although ophthalmic surgeon at the hospital, was better known as a philosopher and a man of wide culture.

Lister took his M.B. in 1852, and not only obtained distinction in other subjects but carried off the gold medal and scholarship in surgery. In 1852 he obtained the F.R.C.S., having already served as house-physician to Dr. Walsh and house-surgeon to Sir John Erichsen. It was not necessary in those days to be qualified before holding a resident appointment. He was thus, Sir StClair continued, 25 years old when he finished his long studentship and close association of no less than nine years (1844–53) with your great school. In his student days Lister was an active member of the debating society and an energetic supporter of the hospital medical school. The direction of his thoughts, even in these student days, towards science and towards the cause of sepsis was shown by his reading a paper on the use of the microscope and one on hospital gangrene.

"First Operation with Anaesthesia"

The first operation ever carried out in this country under a general anaesthetic was performed in University College on December 21, 1846, not a hundred years ago, and Lister was present at it. It was performed by that brilliant operator Liston, who, to spare the patient pain in those pre-anaesthetic days, had acquired such dexterity that it was recorded that he could amputate a limb in less than half a minute. In the picture (which Sir StClair demonstrated) recording this historical occasion they would see that the ether was being administered by Mr. Squire, of the old-established firm of chemists which flourishes in Oxford Street. Liston was being assisted by W. Cadge, who afterwards was a well-known surgeon in Norwich and throughout East Anglia. Next to him was another distinguished pupil of this school, Russell Reynolds, who became President of the Royal College of Physicians. The next but one on his right was Lister, who at the time was house-surgeon to Erichsen, represented sitting down beside him. Among other U.C.H. men in the picture were Graily Hewett, afterwards a well-known obstetrician on the staff, and Clover, who became one of the early anaesthetists and was still remembered by Clover's inhaler. The operation was an amputation through the thigh. Its duration was timed by Squire and three of his assistants, and their records varied between 28 and 25 seconds.*

* This picture was kindly lent by the Curator of the Wellcome Historical Medical Museum, and can be seen at 183, Euston Road.

Lister not only resided in the hospital as house-physician and as house-surgeon, but in the latter office he served an extra half-term. His intense conscientiousness impelled him to devote still more time to perfecting his knowledge and experience by a tour of some foreign schools before embarking on practice. Sharpey, the professor who had done so much in fostering Lister's physiological bent, advised him, before visiting Continental schools, to go to Edinburgh to work under Professor James Syme, then one of the leading surgeons of Europe. In Edinburgh Lister became Symes's house-surgeon, then his assistant, then his son-in-law, and finally succeeded him as professor of surgery in the University.

Lister, Sir StClair remarked, had done more for the progress of surgery than all the surgeons of the world since the days of Hippocrates had together been able to effect. The application of his principles, even during his lifetime, saved more lives than all the wars of Napoleon had destroyed. It was his work which had made possible most of the achievements of surgery and of medicine in this age.

Septic Surgery

Those who were not living in the time of this astounding evolution might feel some difficulty in realizing with what horrors surgery was accompanied before his day. Suppuration occurred in the majority of operation wounds; every surgical ward in the world reeked with the stench of putrefaction; and the "hospital smell" in surgical wards was accepted as inevitable. The operation death rate before the coming of Lister—and even in his own wards in early days—was from 25 to 40 per cent. In 1874 Erichsen published the results of all the amputations in University College Hospital and recorded that he considered a general mortality of 25 per cent. "a very satisfactory result." Sometimes in military hospitals the death rate would mount up to 75 to 90 per cent. In lying-in hospitals the death rate might at times reach a mortality of 25 to 35 per cent. Last year, in this country, it was not 30 per cent. but about 30 per ten thousand. When Lister worked in their wards the scope of surgery was so limited that one theatre and one day a week were sufficient for the operations of the entire staff. The operations consisted chiefly of amputations of limbs crushed by accidents, or with compound fractures, for in those days, as in all our wars up to the Boer War at the end of last century, compound fractures were so generally followed by sepsis, pyaemia, and death that amputation was the usual treatment. Operations were rarely if ever attempted on the cavities or joints of the body, and no one in those days could even imagine the miracles which were awaiting the coming of Pasteur and Lister. Erichsen, to whom Lister was house-surgeon, was even rash enough to prophesy in 1874 that "the abdomen, the chest, and the brain would be for ever shut from the intrusion of the wise and humane surgeon." Another surgeon had pronounced that "an abdominal operation should be classed amongst the methods of the executioner."

University College Hospital was perhaps the first in London to learn of Lister's evangel and to practise his methods. Marcus Beck, a brilliant man on the junior staff and one whose early death was universally deplored, was a cousin of Lister, with whom he lived and studied in Glasgow. In 1876 he was one of the first to carry out antiseptic methods thoroughly and efficiently. This was done in face of such almost unbelievable opposition that he wrote to his relative that "it is a very thankless task to preach antiseptics to a London audience." Later on University College Hospital supplied another apostle who met with more success—namely, Sir Rickman Godlee, a nephew of Lister.

Lister, Sir StClair Thomson said in conclusion, had wrought more for the relief of bodily suffering, for the security of human life, for the prevention of anxiety, for the conversion of fear into joy, for the promotion of happiness, and for the enrichment of the life of mankind than any one man who had ever trod this earth.

SOUTH AFRICAN MEDICAL CONGRESS

PROCEEDINGS AT LOURENÇO MARQUES

The thirty-second South African Medical Congress, the first in Mozambique Colony, was held in Lourenço Marques from September 8 to 14 under the presidency of Dr. Vasco Palmeirim, Director of Medical Services of the Colony of Mozambique. The programme, as in previous South African Congresses, included plenary sessions, sectional meetings, annual meetings of groups of the Medical Association of South Africa (British Medical Association), and entertainments. Congress met in plenary session during the first half of four mornings. On Friday, September 9, there was a symposium on broncho-pulmonary non-tuberculous suppurations. The subject was introduced by Dr. N. de Almeida of the Instituto Português de Oncologia, Lisbon; and from the radiological aspect by Dr. R. J. W. Charlton of Johannesburg. The openers of the discussion were: from the medical aspect, Dr. D. P. Marais of Capetown; from the surgical aspect, Mr. A. Radford of Durban; and from the radiological aspect, Dr. S. Ferreira of Lourenço Marques. Saturday morning was devoted to a symposium on malaria, a subject of very great local interest. Papers were contributed by Drs. Alberto Soeiro and A. Rebelo of Lourenço Marques on the epidemiology and parasitology of the disease; by Professor Froilano de Melo of Nova Gôa (Portuguese India) on treatment; and by Dr. A. J. Orenstein of Johannesburg on the drug prophylaxis of malaria. The openers of the discussion were Drs. A. Pijper of Pretoria, J. A. Macfadyen of Durban, and M. Andrade of Lourenço Marques.

Anti-malaria Campaign in Tropical Africa

Dr. Alberto Soeiro, who is physician at the Central Hospital at Lourenço Marques, in his paper on some aspects of the anti-malaria campaign in tropical Africa, pointed out that it would not be far from the truth to affirm that malaria affected one-third of the population of the world. It had rendered difficult and sometimes impossible the agricultural and industrial development of some of the richest regions. About 2,000,000 lives paid an annual toll to malaria. This number did not include the lives lost indirectly by the pauperization which malaria provoked in various populations. In tropical Africa the fight presented many complicated problems, generally intimately associated with climatic and topographical conditions, or with the primitive conditions under which the inhabitants lived and with the scarcity of population.

Malaria control was always an essentially local problem, and therefore there were as many different methods of fighting it as there were infected regions. Experience proved that it was impossible to employ exclusively one method without losing sight of the economic factor, which must always be borne in mind at each step. The great difficulty was due partly to the prodigious fecundity of the anopheles and its facility of adaptation, which was aggravated, in tropical regions, by climatic conditions eminently suitable for its multiplication, and partly to the ignorance and indifference of the native populations. The work of the entomologist was as necessary to the doctor as the competency of the doctor was indispensable to the entomologist. In the task of malaria control it was necessary to bear in mind, first, that any method employed must be accompanied by constant vigilance and rigorous continuity; secondly, that no campaign could be undertaken without secure financial means which allowed the realization of a previously studied plan; and, thirdly, that the initiative must be taken by the State and municipalities, which must start works of sanitation and encourage others to do so on all lands that might constitute a danger to public health. Many problems still needed to be studied, notably the influence of malaria on native infantile mortality, the influence of treatment on the immunity of native populations, the various strains of parasites, the local standard treatment, and the prophylaxis of malaria in Africa.

Angiopneumography

On Monday gastric and duodenal ulcers were discussed. Their treatment was dealt with in papers by Dr. V. Palmeirim of Lourenço Marques and Mr. Lindsay Sandes of Capetown; radiological aspects were discussed by Dr. S. Ferreira of Lourenço Marques and Dr. M. Weinbren of Johannesburg. Set down for the same morning was a discussion on the importance of angiopneumography for the interpretation of pulmonary radiographs. This subject was presented by Professor Lopo de Carvalho. He stated that after numerous experiments on laboratory animals he had succeeded with his collaborators, in May, 1930, in visualizing the pulmonary vessels in man. The solution of the problem might seem quite simple, since the methods of cerebral arteriography introduced by Egas Moniz and those of abdominal aortography carried out by Reinaldo dos Santos were both based upon the injection of an opaque substance into the blood stream. Such was not, however, the case. Long and wearisome experiments had to be carried out in order to render angiopneumography practical and harmless. The essential of this new method consists in injecting into the right auricle of the heart a highly concentrated (120 per cent.) solution of sodium iodide. The auricle is reached by means of a catheter opaque to *x* rays introduced into one of the cubital veins, its gradual advance being followed on the screen. The catheter is pushed in slowly and, simultaneously with its introduction, small quantities of physiological serum are injected with the aid of a syringe fitted to the other end of the catheter. This makes its progress easier and prevents the formation of blood clots within the tube. As soon as the auricle is reached, or the lower end of the vena cava, the *x*-ray apparatus is made ready for taking the photograph and the cassette with the film is placed against the patient's thorax.

This new method was as yet in its infancy, but the results obtained were so precise and clear as to allow the assumption that it would be possible in the near future to solve some of the problems of the semiotics and pathology of pulmonary diseases that were at present still obscure. He remarked that timorous people might still be afraid of the application of the angiopneumographic method. Its harmlessness, however, had been sufficiently clearly demonstrated to justify the widest possible application. The discussion on this subject was opened by Dr. S. K. Montgomery of Capetown.

At the final plenary session two subjects were considered. Professor C. F. M. Saint of Capetown introduced a discussion on the toxaemia of thyroid diseases, while that on the circulation of the myocardium was introduced by Professor Maximino Correia of the University of Coimbra.

Work in the Sections

The remaining papers were distributed among the usual five sections: medicine, surgery, gynaecology and obstetrics, public health, and special subjects. A large number of papers on a great variety of subjects were read and discussed. Many of these were, as was to be expected, on subjects of local interest. They included such subjects as African ethnology by Dr. R. Elsdon-Dew of Johannesburg; artificial feeding of infants in the Tropics by Dr. F. Martins of Lourenço Marques; malignant tumours of the liver in Mozambique natives by Dr. M. D. Prates of Lisbon; and surgical tuberculosis among non-Europeans by Dr. G. T. du Toit of Johannesburg. Malaria came in for further discussion in the section of public health, where Dr. Botha de Meillon of the South African Institute

for Medical Research contributed a valuable paper on the researches he has for several years been carrying out on local anopheles. An interesting paper in the section of medicine was that of Professor Grober of the Jena Institute for Physical Therapeutics, which dealt with the acclimatization of Europeans in South Africa. Professor Grober's departure from Germany had unfortunately been delayed by illness. In his absence his paper was read by Miss Riemerschmid, who during the previous eighteen months had been carrying out a solar survey of the Union of South Africa under the auspices of the Jena Institute. The paper discussed the data so far collected by Miss Riemerschmid.

The significance of wild animals as carriers or reservoirs of disease to the stock-raising industry of the Union was dealt with in a paper read by Dr. Gilles de Kock, Acting Director of Veterinary Services of the Union of South Africa Agricultural Department. With regard to the outbreak of foot-and-mouth disease which occurred recently in the Game Reserve at the Kruger National Park, he said, the question had been raised whether the disease was enzootic in game. He described the outbreak, which was diagnosed on July 20 in a herd of cattle by one of the rangers, and said that though infection in cattle was probably not associated with that in game the possibility had not been overlooked. Dr. de Kock also said that small herds of cattle would be maintained in the Kruger National Park to serve as a "barometer" to indicate whether domesticated animals would become infected from game. All officials concerned with the control of game had been instructed to keep a very sharp lookout for anything of a suspicious nature among game. Suspected animals would be shot and examined. Active steps had also been taken to eliminate every possible source of infection from outside. It was hoped that by this means information would be gained as to whether foot-and-mouth disease was enzootic in game in the Kruger Park. Should that be the case the Union authorities would attempt isolation of the Game Reserve in such a way that it would not endanger stock in the rest of the Union.

Malnutrition

The public conscience in the Union has recently been greatly stirred by the accumulating evidence of undernourishment among the Bantu (negro) and "poor white" populations. The subject was hotly discussed in Parliament during the budget debate in August. As two papers were set down on the programme for combined discussion by the sections of medicine and public health a lively discussion inevitably ensued. The debate demonstrated that the medical profession in South Africa was only too well aware of the extent to which the health of a large portion of the population was being undermined by the grossly inadequate amount of protective foods being consumed in the country. No fewer than seven resolutions with various amendments were tabled during the discussion. Some of these savoured too much of dictation to the Government, and were reluctantly withdrawn. Eventually a comprehensive resolution, proposed by Dr. Gilles de Kock, Deputy Director of Veterinary Services for the Union, and seconded by Sir Edward Thornton, former Secretary for Public Health of the Union, was carried unanimously. This resolution read as follows:

"That in view of the extent of malnutrition or undernourishment in South Africa and the deleterious effects on large sections of the population this Congress recommends: (1) that every facility be given by the departments concerned to expedite the investigations into the human, animal, agricultural, and economic aspects of nutrition, so that it can be placed on a proper basis; (2) that the closest contact between the research departments concerned with the problem be established; and (3) that measures be immediately considered by the departments concerned to deal with the existing position, particularly in respect of the children in badly affected areas."

A further resolution was also passed recommending to the Union Government the advisability of buying maize at current prices for storage and its subsequent distribution at cost price plus storage to natives in the rural areas during the winter and spring seasons. Other motions urged the extension of the subsidized milk and butter schemes, and that the issue of subsidized milk be extended to the native population.

Aircraft and Yellow Fever

The risk of aeroplanes spreading yellow fever throughout the continent of Africa was emphasized by Dr. G. A. Park Ross, Deputy Chief Health Officer of the Union, in an address to the public health section. He declared that the consequences to trade of infection down the East Coast would be appalling. He had devised apparatus which would automatically "disinsectize" aeroplanes; Imperial Airways had equipped one of its machines with this apparatus for experimental purposes. He urged that the cleaning of aeroplanes should be made compulsory. The classical urban type of yellow fever carried by *Aëdes aegypti,* he said, was widely distributed in West Africa, and might already be found east of the Nile. It had not been demonstrated in Uganda or Kenya, or in territories to the south. In the vast Congo Free State its distribution was so far undetermined. Jungle yellow fever, an identical disease carried by a different vector, had not so far been demonstrated in Africa. Not nearly enough sampling of populations, human and monkey, by the mouse-protection test had been done, especially south of the Equator. Sampling, however, was now proceeding apace under the Rockefeller Institute at Entebbe; until a definite absence of infection in man and monkey was proved there was no alternative but to regard certain large portions of the continent as potentially infective. Were infection introduced, say, to the East Coast, it might exist for a long time without being recognized; it might establish itself as the urban or the jungle type or both—in which case it would probably not be eradicable.

Plane-carried infected passengers and mosquitos were the danger. The former were infectious in the incubation stage, and might be carriers for six days before the disease manifested itself. In six days one could travel anywhere across the continent by air. Under African conditions of air travel the infected mosquito was a far graver risk. Present arrangements to prevent conveyance of vectors were cumbersome and not trustworthy. Regulations governing traffic presumed that planes could be relied on to land only at scheduled aerodromes, that these scheduled aerodromes were kept mosquito-free, and, lastly, that local arrangements on aerodromes dealt effectively with plane-carried mosquitos. He demonstrated the apparatus and special disinfectant he had introduced, and discussed their application to planes, giving details of the arrangements for handling passengers and suspects at Durban, where, by combining examining offices and detention and hospital quarters on a floating unit instead of on shore buildings, he claimed to have solved the mosquito and detention question not only satisfactorily but more cheaply than at any other port. The discussion which followed indicated that medical men in South Africa refused to be unduly alarmed at the suggested risk of introduction of yellow fever infection into the country. It was generally conceded, however, that the position warranted careful watching by the authorities.

Entertainments

The Portuguese hosts were lavish in their provision of entertainment of all kinds to delegates and their wives. All the sports and other clubs conferred honorary membership upon the visitors. The official programme of enter-

tainments included the presidential reception at the famous Polana Hotel on Thursday evening; a garden party held on Friday afternoon in the grounds of the Governor-General's residence, which was attended by about 800 guests; a play entitled *Dr. Knock; or, the Miracle of Medicine* by Jules Romains (translated from the French) performed at the Gilvicente Theatre by local amateurs, headed by Dr. Abel de Carvalho, secretary of the Congress; an open-air fête in the Polana Hotel Gardens on Saturday night; and on Sunday afternoon a native fête was witnessed, and that evening a nautical fête in the harbour. Dr. Vasco Palmeirim presided at the Congress banquet on Monday night. Mr. Lindsay Sandes, replying to the toast of the Medical Association of South Africa, congratulated the Portuguese doctors on the high standard of their papers read at the conference. On behalf of the South African Branch of the British Medical Association, he presented Dr. Abel de Carvalho, honorary organizing secretary of the Congress, with a suitably inscribed gold watch. Sir Edward Thornton said two outstanding impressions had been gained from the visit. They were the high standard of medical service in Mozambique and the warm comradeship with fellow-workers in South Africa. Dr. Abel Gouveia Pinlo proposed the toast of the guests, and Professor Dart of the Witwatersrand University replied, concluding his speech in Portuguese. The social side of Congress was concluded on Tuesday night by a very successful ball.

COMMONWEALTH FUND FELLOWSHIPS

The Commonwealth Fund of New York has established for British subjects a number of fellowships tenable at American universities, not more than five of which will be offered in 1939 to persons holding appointments over-seas under the British Government, the Government of India, or the Government of a British Dominion, Colony, Protectorate, or Mandated Territory. The actual number of service fellows to be appointed in 1939 will be determined by the Committee of Award.

Candidates must be of British descent, single or married, and must not have attained the age of 35 on September 1 of the year of award. They must submit a definite scheme of research work or advanced study to be carried out during their residence in the United States, and must produce evidence of their capacity to pursue it with advantage; but, speaking generally, no limitation is imposed on the subject of study to be undertaken. Fellowships are tenable for a minimum period of fifteen months and a maximum period of twenty-four months, which will run from the date of departure from the country in which the fellow is engaged in Government service to the date of his arrival on return. There is no fixed stipend, but it is estimated that the cost to the Commonwealth Fund of each fellowship is approximately 3,000 dollars per annum. Each fellowship includes provision for: (*a*) An equipment allowance of 200 dollars and the cost of the fellow's travel, but not his wife's, from the country in which he is serving to the United States and return. (*b*) Tuition, laboratory fees, etc. (*c*) 150 dollars a month, paid quarterly, for living expenses during the tenure of the fellowship, from the date of leaving the country in which the fellow is serving. An advance of one month's living allowance may be made to an appointee. (*d*) Allowance for travelling while in the United States on tours approved by the Commonwealth Fund. An additional allowance at the rate of 50 dollars a month, with some increased provision for summer travel in the United States, is made for a married fellow accompanied by his wife, but he is not at liberty to bring his children to the United States except by special permission of the Fund. The Committee hopes to notify successful candidates before the end of April, 1939, and applications, submitted on the prescribed form, must reach the Secretary, Commonwealth Fund Fellowships, 35, Portman Square, W.1, not later than February 1, 1939.

OPENING OF THE NEW SESSION

LONDON SCHOOL OF MEDICINE FOR WOMEN

LORD HORDER'S ADDRESS

At the opening of the new session of the London (Royal Free Hospital) School of Medicine for Women an address was delivered by Lord Horder on the aptitude of women for clinical medicine. The Dean of the School, Dr. Elizabeth Bolton, presided.

Lord Horder said that there was nothing more natural than that women should take up the profession of medicine and succeed in it. Was there so much difference between doctoring and nursing? And would anybody suggest that women's success in nursing was a matter for surprise or even for congratulation? Between the man doctor and the woman doctor there was no essential difference, though he thought that a good man doctor had a little more of the feminine in him than the average, and a similar sentiment applied to the woman doctor. He believed it to be the fact also that the proportion of charlatans among women was much smaller than among men. Women were said to have more intuition than men, and there were those who thought that this should give them an advantage over their male colleagues in the direction of what was sometimes called clinical instinct. Certainly women were more thorough than the opposite sex—a part, he supposed, of their greater conscientiousness—while, on the other hand, men displayed more initiative. Again, women were more curious than men, a curiosity which had borne fruit in those women who had already made their names famous in research.

That women were more industrious and more studious he was, with shame, compelled to admit, though he warned them against vaunting themselves overmuch with regard to this virtue. If indulged in to excess it might, like any other virtue, be their undoing. Seriously, he warned them also against too much study and reading. If they read too much they would find that they had not left themselves time to think and to do essential things. Knowledge was valuable in so far as it helped one in action. Medicine demanded of its students of either sex a whole-hearted devotion and the fullest employment of all the faculties they possessed.

Powers of Observation

The power of observation, Lord Horder went on, was one particularly to be cultivated by the doctor, man or woman. All the faculties might be brought into action in the endeavour to observe—the sight, the hearing, and the smell could all be employed to note the deviations from the average so that deductions might be drawn. Observations of the characteristics of average people, their facial colour, how they shook hands, how they carried on normal conversation, how they breathed, all helped to train the mind to use instruments with greater efficiency when it came to the consulting-room. The sound of a cough and the rhythm of breathing, even over the telephone, were full of meaning to the trained ear. Clinical instinct was not a sixth sense: it came from the fact that some people trained their powers of observation until they observed without being conscious of doing so.

A diagnosis should never be made on negative findings. If nothing wrong could be found the whole subject should be reviewed again in the light of the simple deviations from the average that had been noticed. Each might be small, but, taken together, they formed a basis for diagnosis. Books and instrumental technique could never supply that knowledge and fundamental wisdom which medicine demanded. Industry could never be a substitute for sensitivity, and therefore medicine wanted the woman in the doctor just as much as it wanted the doctor in the woman.

Finally Lord Horder indicated the wide fields open to the woman doctor. She must be tired of hearing references to her special fitness for obstetrics and school inspection. Every field was open to her. In the sociological field there was great room. He was not at all sure that the medical profession was pulling its weight in social economics. The preventive measures, which called for more and more of the doctor's energy, were social economic work of the first order.

On the motion of Dr. Jenner Hoskin, seconded by Professor Lucas Keene, a vote of thanks was accorded to Lord Horder for his address.

MOTOR CARS FOR 1939

THE EARL'S COURT EXHIBITION

[From our Motoring Correspondent]

This year's International Motor Show, the thirty-second organized by the Society of Motor Manufacturers and Traders, which opened on Thursday, October 13, and will continue until Saturday, October 22, is for the second time taking place at Earl's Court, London, S.W. While in the aggregate the number of exhibitors is rather less than last year, it will be found that the international character of the show is well maintained. The productions of fifty-eight different car manufacturers are displayed, of which half are British, the remainder representing the principal automobile productions of Belgium, Canada, France, Germany, Italy, and the United States.

Some Modern Trends

Generally speaking, it may be said that there are no startling departures in the design and construction of cars, manufacturers having been content to continue their 1938 models with minor modifications and improvements in the chassis details, in the bodywork, or in many cases in both. A feature of the new models, however, is the attention which has been paid to the question of securing greater fuel economy—that is, more miles to the gallon of petrol—than hitherto. This is being achieved not only by improvements in engines and carburettors, but also by a reduction in the weight of cars and their chief components. Various recent tests of 10-h.p. cars conducted under official supervision have shown fuel consumption rates of 47½ m.p.g. to be possible, with 40 m.p.g. as quite an easily attainable figure. As a result of the high cost of steel and other raw materials it was expected that manufacturers would have to increase their prices. Some of them have done so, but several of the big concerns, such as Austin, Hillman, Morris, and Standard, have found it possible to offer certain of their productions at slightly lower prices than last year. Whether dearer or cheaper, it cannot be doubted that by reason of the various detail improvements and the very complete range of accessories and conveniences now included in the price 1939 cars are excellent value for money.

Mechanical Modifications and Improvements

All the cars shown, except two makes, have engines with four, six, or eight vertical cylinders, the exceptions being the Jowett, which remains faithful to a two- or four-cylinder horizontal power unit, and the German D.K.W., the only car at the exhibition with an engine working on the two- instead of the more familiar four-stroke principle. So far as cars of from 12 to 14 h.p. are concerned, the "craze" of two or three years ago in favour of six-cylinder engines would appear to have died out, the popularity of four-cylinder power units for this type of vehicle being more noticeable than ever, a notable newcomer to the class being the Vauxhall Twelve-Four, which replaces a six-cylinder car of this power. This reversion to engines with only four cylinders is due both to improved design of the engine components and to the greater use of rubber in fixing the power unit in the chassis with the object of overcoming vibration.

It is interesting to notice, despite the continued progress of the Diesel or heavy-oil engine in the case of motor omnibuses, coaches, and commercial vehicles, that petrol, benzol, and mixtures of these spirits continue as the fuels for the power units of cars in Great Britain, although in France a few makers are now supplying one or more models with engines using heavy oil instead of petrol.

Synchromesh Change-speed Gears

On British cars gearboxes with four forward speeds are now usual. American cars and a few of English manufacture, on the other hand, have only three speeds, but the gear ratios are so chosen that satisfactory results are given in practical use. During the summer of 1937 there were many references in the motoring press to the probable introduction of "two-pedal" car control, making clutch action automatic and so rendering the familiar clutch pedal unnecessary, and the 1938 meeting of the British Association was notable for the publicity given to a gearless transmission designed to do away altogether with the usual clutch and gearbox. Although one or other of such innovations in car design may in time become general, the present show gives no signs of early departure from current practice. The Daimler and Lanchester concerns still retain the fluid flywheel system of transmission, and the Armstrong-Siddeley the self-changing gearbox, but it would appear to be generally agreed in motor engineering circles that the improvements effected in synchronized change-speed gears have very largely done away with the difficulties formerly experienced with gear-changing.

This year, too, not so much is heard of "over-drives," or something more than the usual direct top gear, for use on level open country roads. These devices, although provided on a number of American cars, are still the exception rather than the rule. The Rover company continues to provide a free-wheel device in conjunction with a four-speed synchromesh gearbox, but there appear to be no new converts among car manufacturers to the free-wheeling idea.

Independent Front-wheel Suspension

Independent front-wheel suspension in place of the usual longitudinal semi-elliptic springs is increasing in popularity, it being found on several more makes of cars than last year, notable additions being the 20-h.p. Armstrong-Siddeley, the 8-h.p., 10-h.p., and 12-h.p. Standards, and the 10-h.p. Sunbeam-Talbot. Improvement in car suspension, giving easier and more comfortable riding, is also said to be secured by what are known as torsion bars in connexion with the chassis springs. The front-wheel drive, while still found on the B.S.A. Scout and Citroën cars, does not appear to have proved popular in this country, a back axle driven by a propeller shaft and spiral bevel or worm gearing continuing the order of the day. This year there is a novelty in a Mercedes-Benz "Colonial" car embodying an all-four road wheel drive and steering.

Attention continues to be devoted to providing cars with powerful, reliable, and easily adjustable mechanical or hydraulic brakes. "Easy-to-clean" steel-spoked road wheels are now generally adopted, and another good point on many of the 1939 cars is the use of larger section tyres. The number of cars fitted with adjustable steering wheels and permanent jacks is increasing, the jacks proving useful not merely for wheel-changing when punctures—now very rare owing to the reliability of modern tyres—are encountered, but also for raising the road wheels clear of the ground during car- and chassis-cleaning operations. It is also satisfactory to find an

extension of the use of grouped chassis lubrication points, which is an advantage to those who still prefer to look after their own cars.

Body Designs

The show is again largely one of covered cars, either saloons or coupés, very few open vehicles being seen, and these mainly for the sporting motorist. For family use the saloon type of body is still the most popular, but for doctors and other professional men, as well as for touring purposes by two people, the drop-head coupé is rapidly growing in favour. The freak designs in streamlined bodywork prevalent a few years ago are now conspicuous by their absence, designers having apparently settled down to a slightly sloped front and rear, with luggage and spare wheel receptacles in the latter. Though "minor modifications and improvements" form the keynote of the show, this is not to say that changes are not slowly but surely taking place. Thus the idea of doing away with the usual chassis frame and securing the engine, gearbox, and transmission directly to the steel frame of the body, as inaugurated by the Citroën company, or the combination of chassis and body frames introduced a year ago in the 10-h.p. car of the Vauxhall company, is slowly progressing, this principle having been applied to the new 12-h.p. and 14-h.p. Vauxhalls and, for the first time, to a Morris car—the newly designed Ten.

In addition to those already mentioned, among the new cars which will be found worthy of inspection are the 16- and 20-h.p. Armstrong-Siddeleys, the 28-h.p. Austin, the B.S.A. Scout 10-h.p. saloon, the Daimler Fifteen, which now has an 18-h.p. engine, the Fiat Twelve, the Humber 27-h.p. Super Snipe, the Jensen eight-cylinder model, the 11.9-h.p. and 12.9-h.p. Lea-Francis cars—these, like the Jensens, being newcomers to the show—the 2.6-litre M.G., the new Morris Ten with integral chassis and body frame, and the new 8-h.p. Morris, the Rover six-cylinder Fourteen, the new 8-h.p., 10-h.p., and 12-h.p. Standards with independent front-wheel suspension, the 10-h.p. Sunbeam-Talbot, the four-cylinder Vauxhall Twelve, and the latest 14/60-, 16/65-, and 18/85-h.p. Wolseleys.

Better Seating and Leg Room

The practice of locating the front and rear seats between the axles to afford more comfortable riding, especially in the larger cars, is increasing, and on some vehicles the front seat is being made wide enough for two passengers in addition to the driver. Minor improvements continue to be introduced in the seats themselves, those at the front now usually having tubular frames which can be adjusted for height and tilt as well as with regard to the amount of leg room available for drivers of different stature. The new tubular seat frames have, too, the advantage of providing space below them for an attaché case or other light articles. Even on what may be termed small cars much greater passenger space is provided than was the case a few years ago, and in a number of such vehicles the rear seat flooring is now quite flat instead of having foot wells. Instrument boards continue to show improvements, the instruments being centrally grouped so as to leave space for large cubby-holes. Indeed, on a few cars a shelf extending over the full width of the instrument board is now being provided.

Some Criticisms

In most covered vehicles attention is still being paid to the problem of preventing fumes from the engine entering the interior and to making better provision for ventilation. The practice of providing for winter use interior heating apparatus of one kind or another is also extending. Notwithstanding all the attention which is being directed to the question of comfort, the designers of motor vehicles would appear to be overlooking the needs of owner-drivers and forcing them to take their cars to service stations for any adjustment, lubrication, or cleaning that may be necessary from time to time. Motor vehicle components needing regular attention never were as accessible as they might be, but the situation is, if anything, worse to-day than it was a few years ago. Thus, front mudguards now extend so far round the road wheels that it is practically impossible to get at the lubricators of the steering pivots without lying on the floor. Another practice that does not recommend itself to many owner-drivers is unfortunately being continued—that of locating the radiator filler cap below the engine bonnet instead of externally in the top centre of the radiator as in earlier years. Radiators do not often need replenishing with water, but when they do it is a nuisance to have to raise the engine bonnet, and, if one is not careful, there is the added annoyance of spilling water over some of the engine components. Rear number plates are still often so incorporated in the bumper, with tail lamps extending beyond the bumper, that in the case of a "bump" from a following car it is the glass of the number plate or of the tail lamp which suffers the first damage. One writer has lately gone so far as to state that on some cars it is necessary to remove the off-side front road wheel and also a detachable plate on the mudguard valance before the engine valves can be got at! This may not affect those owners who live in towns and cities where service stations are many, but there are still many car users living in remote areas where the nearest service station is several miles away. There appears, too, to be an increasing tendency to locate accumulator batteries under the engine bonnet instead of below the floor boards, a location which certainly provides greater accessibility, although in the opinion of some experienced motorists the under-bonnet position is not without drawbacks to the battery itself.

In view of the many instances reported of bags containing special drugs and instruments being stolen from doctors' cars, a motorist writing to the *Autocar* mentions that no car manufacturer has as yet designed a special "Doctor's Model," and goes on to suggest that a small lock-up cubby-hole capable of taking a medical man's emergency case should be provided on the instrument board, with an accessible compartment in the rear of the car, under lock and key, for more bulky apparatus. On the other hand, another doctor considers that anything which needs locking and unlocking—even the car doors—is not the ideal solution of the problem owing to the time taken up in having to use a lock and key.

Wireless Sets for Motor Cars

Evidence of the increase—although still slow as compared with what obtains in the United States—in the use of wireless receiving sets on motor vehicles is afforded by the fact that for the first time car wireless sets are being exhibited at the show. In accordance with the conditions laid down by the exhibition organizers only sets that have been designed and constructed specifically for motor-car installation, and that are recommended by the particular makers as being suitable for installation on their models, are displayed. There is as yet no car on which a wireless set is included in the list price, but several models are being supplied with one or other form of aerial built into the bodywork in order to facilitate the installation of a set if desired by the car purchaser.

Among the Accessories

The galleries at the Earl's Court exhibition building are again devoted to an array of special fittings and accessories. In view of the latest motor lighting regulations chief interest probably lies in the lamps designed to conform with the legal requirements which now apply to old as well as to new cars. Purchasers of new vehicles will have no difficulty as regards these regulations. In the case of old cars, however, it is for the owners to make themselves acquainted with the most satisfactory and convenient ways of converting their lamps in order that they

may comply with the law. There are also many examples of lamps specially adapted for driving in fog. What are known as "pass lights," with flat-top beams, have been introduced in connexion with the headlight dazzle-preventing problem as a substitute for dipping headlamps, a single control switching off both headlights and simultaneously bringing into operation the "pass light" when passing other cars after dark.

In the tyre section there are one or two new exhibits worthy of special mention. The Goodyear company has introduced a new inner tube known as the "lifeguard," the feature of which is that the tube has formed within it a supplementary two-ply fabric tyre, the two being so connected as to be inflated through the one valve. The object of the new tube is to avoid accident, and serious damage to the main outer cover, in case of tube burst or puncture, the resulting loss of air from the ordinary tube being slowly replaced from the reserve supply in the extra tube through a vent. It is claimed that should a burst or puncture be experienced, even when travelling at high speed, cars having tyres fitted with the new "lifeguard" can be relied upon to run under perfect control from one-half to three-quarters of a mile, allowing the driver ample time to bring the vehicle safely to a stop.

Finally, it may be mentioned that the exhibition is open daily, except Sunday, from 10 a.m. until 10 p.m., and that the price of admission is 2s. 6d., except on Tuesday, October 18, and Thursday, October 20, when it is 5s. up to 5 p.m. and 2s. 6d. afterwards. The Ford company is not this year holding its usual exhibition at the Albert Hall, Kensington. It is proposed, in next week's issue, to follow the customary plan of referring to some of the new cars in more detail, especially those likely to appeal to medical men from the point of view of suitability, reliability, and both purchase and subsequent maintenance costs.

C. J. W.

RESISTANCE TO EXPERIMENTAL CANCER

SIR FREDERICK BANTING'S LECTURE

The Barnes Hall of the Royal Society of Medicine was filled on October 11 when Sir Frederick G. Banting, F.R.S., of the University of Toronto, delivered the second W. E. Dixon Memorial Lecture. His subject had been announced as "The Immunity Aspect of the Tumour Problem," but he altered this on delivery to "Resistance to Experimental Cancer."

Sir Frederick Banting began by remarking that in 1925 he visited the laboratory of Dr. Gye, and since that time his main interest in medical research had centred around the cancer problem. Many experiments had been performed in his own laboratory, and although he realized that to report experiments on cancer in London was carrying coals to Newcastle, he desired to present to his audience some of this work. The original title of his lecture mentioned "immunity," but until it was finally proved that cancer in general was due to a virus or living agent it was better to use the term "resistance," although the other term was permissible in the case of filterable fowl tumours which had been shown to be due to a virus.

It was impossible to give even a brief review of the immense literature on this subject. Before 1903 workers in isolated laboratories had made observations on tumours in animals, especially mice, and had transplanted fragments of tumour into other mice, thus carrying the tumour strain; but it was not generally accepted that these scientific curiosities had a very close relationship to the tumour problem in man. With the establishment of the Imperial Cancer Research Fund co-ordinated research on cancer was started, and to the original group of workers under those auspices and to their successors the world would always owe a deep debt of gratitude. It was they who first established the fact that cancer was fundamentally the same in all animals and in man. They studied many strains of transplantable tumours in many different species of animals, and their observations formed the basis for much of the subsequent research.

Earlier Work

The early experimental work on mammalian tumours demonstrated clearly that tumours in animals were identical with tumours in man in respect of mode of origin, age incidence, clinical course, mode of growth, and infiltration of surrounding tissue. Transplantation could only be carried out within the species; there was a strict specificity. Tumours could only be propagated by the transplantation of living cells. Until 1909 these constituted the most important of the facts known. During the next decade, however, the work of Rous and his associates and that of Japanese investigators changed the course of the inquiry. An outstanding point was that a variety of chemical agents would induce tumour, and once the tumour was induced the chemical no longer operated in the perpetuation of the growth. From the aspect of resistance, therefore, chemically induced tumours did not differ from mammalian tumours.

In 1910 Rous and others found a number of sarcomas which could be propagated in fowls by means of a cell-free filtrate. At first most pathologists considered these tumours to be due to inflammation, and not to be true sarcomas, but on further investigation they had become accepted as genuine cancer. Rous sarcoma No. 1 was one of the most universally used laboratory tumours. With this tumour Gye had done most of the work on his specific factor theory. In every way the Rous sarcoma was identifiable with mammalian tumours.

Since 1926 a study of the Rous sarcoma had been undertaken in the lecturer's laboratories at Toronto. The birds used were fully grown chickens from 6 to 12 months old. The age of the bird was an important factor, because in young birds Rous sarcoma developed more rapidly and killed more readily than in older ones. Gye used young chicks and found, out of 6,000, only one in which the tumour regressed. In the work in the lecturer's own laboratories transplants were made into the muscle of both breasts with a trocar 2 mm. in diameter. When tissues were required for transplantation the chicken with the most rapidly growing tumour was killed; the bird with the more slow-growing was allowed to live. During the six years from 1928 to 1934, 1,768 chickens were transplanted. Of these, 621 were killed to obtain tumour tissue, and of the remaining 1,147 birds, 1,140 died of tumour. Seven birds—1 in 164—became resistant to Rous sarcoma. The resistant bird by his definition was one in which a well-established tumour regressed; on additional transplantation a second small tumour might develop, but this also regressed; tumour did not develop on subsequent transplantation, and the bird did not die of tumour.

Experiments on the Rous Strain

During the past ten years in his laboratories 6,000 fowls had been used for experimental work on the Rous sarcoma; 118 birds, or 1 in 50, had shown some degree of resistance. Of the 118 birds, forty-four had received more than five direct transplants and remained negative, some of them being kept in the laboratory for as long as five years, during which as many as forty transplants were made. The thirty-eight which had died showed no sign of tumour on necropsy, and the other six were still alive and well. In twenty birds a tumour of large size regressed, but on subsequent transplantation the birds again developed tumour and died. One bird, which had developed five large tumours, died as a result of the fifth, the first four having regressed. Instances had been observed in which a large tumour in one breast had almost disappeared, but direct transplant or injection of

tumour extract into the opposite breast caused a rapid growth of the original tumour.

From the earliest work on transplantation it had been observed that the size of the transplant had an important bearing on the result, and it was thought that probably a tumour could be produced in a resistant bird by administration of a large dose of active tumour cell. A bird was given 6 c.cm. of finely divided tumour cell—a dose estimated to produce sufficient tumour-containing substance to kill 6,000 birds—and did develop a tumour, but two weeks later the tumour was absorbed, and the breast into which the injection had been made was quite normal. One of the first signs of regression was often the appearance of the bird. The comb became red and there was an increase in weight even while the tumour remained large.

Very early in the investigation it was found that the plasma of Rous-resistant birds neutralized the cell-free active filtrates of a Rous tumour. More than forty experiments on these lines had been carried out. In the earlier ones 2 c.cm. of resistant plasma was used to neutralize 1 c.cm. of potent extract; in later work only a fraction of 1 c.cm. of plasma was necessary, probably owing to the hyperimmunity developed by resistant birds as a result of repeated tumour-cell inoculation. From the fact that large amounts of highly immune plasma had no effect on the growth of the tumour it would appear that the virus, being within the cancer cell, was not affected by the antibodies in the blood. When Rous cells were injected into the resistant bird the cells died and were absorbed. Did they die from lack of blood supply, or were they killed by the antibodies of the blood? The point whether or not the tumour cell membrane could afford an absolute protection to the virus against the immune serum was an important one and required further investigation. Experiments were also made in which the tumour extracts were mixed with an immune bird plasma and injected at the same time. It was found that one or two out of three birds so injected always developed the tumour, suggesting that the immune plasma required time for the neutralization of a virus. Further experiments showed that it was necessary to give approximately 30 c.cm. of resistant plasma in order to protect a bird against the injection of 1 c.cm. of a potent tumour extract. The plasma when injected into the body was diluted by the blood and other body fluids, and unless large quantities of the serum were given there was not enough concentration at the site of inoculation to bring about protection of the local cells. All tissues of a resistant bird appeared to be resistant both to cell-free filtrates and to Rous tumour cells.

Cross-immunological Reactions

Since 1933 there had also been available for study Fuginami strains of filterable fowl tumours. These tumours could be propagated in both chickens and ducks. They showed a much greater tendency to regression than the Rous. For these experiments 180 birds had been used. Of this number 158 died of tumour or were killed for transplants, while 22 showed some degree of resistance. This was 1 in 8, as compared with 1 in 51 in the case of Rous sarcoma. Twelve birds which were resistant to Fuginami were inoculated with Rous extract or cells, and ten of them developed Rous tumours and died, while the other two became resistant to Rous as well as to Fuginami.

Although the Fuginami tumour had not been studied as extensively as the Rous it would appear that there was a similar variation in the degree of immunity in the two tumour strains. The regression of one tumour did not always mean that there would not be the development of another tumour on subsequent transplantation. Two of the Rous-resistant birds were given an extract of dried Fuginami tumour. One of them had been under observation for three years previously and had remained negative to many Rous transplantations. Both these birds developed large tumours following the Fuginami inoculation and died from secondaries in the lung. Blood was obtained from the heart of one of these birds at necropsy and the plasma was found completely to neutralize Rous sarcoma extract. This indicated that these birds remained resistant to Rous tumour although dying of Fuginami. It was also found that the plasma of a Fuginami-resistant bird could neutralize Fuginami cell-free extract, but did not resist Rous extract.

Production of Dibenzanthracene Tumours

Sir Frederick Banting proceeded to describe a further experiment in which twelve Rous-resistant birds and twelve normal birds were each given three injections of 5 mg. of dibenzanthracene. Four of the twelve resistant birds were given Rous transplants at intervals throughout the experiment and they remained negative to Rous. Six of these resistant birds developed dibenzanthracene tumours and six remained negative. Of the normal birds eight developed the tumours, three remained negative, and one died of other causes. Evidently a high degree of resistance to Rous did not protect the bird against the development of dibenzanthracene tumour.

In the periodic examination of birds with growing tumours there was sometimes encountered an exudation of fluid in the skin overlying the tumour. This fluid on being drawn off did not give rise to tumour when injected into other birds, but had a neutralizing effect equivalent to that of resistant serum when added to tumour extract.

Many attempts had been made to immunize a fowl to Rous sarcoma. The birds had been given repeated injections of neutralized or partially neutralized serum of the tumour extract mixtures. Owing to the many failures to produce with constancy even minor degrees of resistance to Rous sarcoma, it was thought that the production of resistance or immunity might be connected with the tumour cell itself. Experiments were therefore prepared with the object of killing the tumour cell by physiological means so that the hypothetical antigenic properties might remain. It was decided to use ammonia for this purpose as it was a by-product of cell metabolism. But the cells thus treated, even when 20 per cent. ammonia was used, gave rise to tumours when injected into normal birds.

Various efforts to produce resistance to Rous tumour were described, including the repeated administration of neutralized mixtures of virus and serum, and immunization by the injection of tumour cells killed with glyceric aldehyde. In this last procedure the cells were suspended in a 4 per cent. solution of glyceric aldehyde and shaken at intervals of three hours. Of the birds injected, three developed tumours and died in the usual time; two others developed tumours which regressed, but on re-transplantation the tumours developed again and the birds died; the remaining bird did not develop a tumour until it received a transplant, when a tumour developed, and the bird died in twenty-five days. The finding was that the injection of cells treated with glyceric aldehyde did not promote the formation of antibodies against tumour, though when the cells had been exposed to dilute solutions of glyceric aldehyde in some cases the tumours were more slow-growing and the bird recovered.

Concurrently with the work on the chicken filterable tumours, certain experiments and observations had been made on three strains of mouse tumour, but with no very satisfactory results.

General Conclusions

Sir Frederick Banting said in conclusion that all this experimental work required a large number of animals, including controls, and a great deal of time, and there was such great variation in the individual animal or bird that the results were often difficult to interpret. The outstanding feature of the cancer problem was the specificity

of the disease. Cancer was identical in the fowl, the mouse, and man, yet the disease could not, with few exceptions, be transmitted outside the species. Resistance to cancer was even more specific. The work to date did not appear to contribute much towards specific treatment. The terms "immunity" and "resistance" were used in association, although, as he had pointed out at the beginning, they referred to different conditions. "Resistance" indicated refractiveness to grafted cells; "immunity," the condition under which the animal was able to combat, perhaps destroy, the intracellular growth.

The balance of evidence suggested that what he had called resistance was a laboratory phenomenon unrelated to cancer of spontaneous nature. It might be simply an indication of reaction between host and tumour cells. If this were the complete explanation of the phenomenon of resistance it could scarcely be imagined that the forces which destroyed a transplanted tumour could ever operate in natural cancer, in which the malignant cells had necessarily the same genetic constitution as the host. But after some of these experiments there lurked in his mind the notion that the forces which effectively rid an animal of a spontaneous tumour might be a combination of intracellular and anti-viral immune bodies. The spontaneous cure of natural cancer was very rare, but there had been experimental tumours which could be propagated with cell-free filtrates and were therefore the equivalent of spontaneous tumours, and these under certain circumstances regressed. The question was whether the regression was brought about by the development of immune bodies which destroyed the virus, or whether it was a more complex process, an interplay of various factors determining either an unlimited growth of the tumour or regression.

The opinion derived from this work was that antigenic differences between host and malignant tissues might be sufficiently great to stimulate antibodies adequate to ensure the disappearance of even spontaneous cancers. It was along these lines that the greatest hope of cancer therapy lay.

Medical Notes in Parliament

Tuberculosis in Newfoundland.—Mr. Malcolm MacDonald, answering Mr. W. Gallacher on October 5, said a survey recently carried out suggested that the incidence of tuberculosis in Newfoundland was about 6,600 cases per 100,000 of the population. Steps had been taken recently to enlarge the tuberculosis sanatorium and to inaugurate special measures to control and prevent the spread of this disease.

Staffordshire County Hospitals.—Mr. Mander asked on October 6 what the arrangements were for hospital treatment for persons resident in Wednesfield and Willenhall organized by the Staffordshire County Council. Mr. Bernays replied that the county council was proceeding with the reorganization of its hospital arrangements, and the present situation did not, to its knowledge, give rise to any difficulties. An assistant medical officer resided at Wordsley Hospital, the medical officer lived in the immediate vicinity, and the services of specialists were available if necessary.

Those medical practitioners whose approval for the purpose of signing recommendations under Sections 1 (3) and 5 (3) of the Mental Treatment Act, 1930, expires on December 31 next are being invited by the Board of Control to make application for the renewal of the approval and are being furnished with forms of application for this purpose. Any other practitioner who may desire to seek approval under the Mental Treatment Act can obtain a form of application on writing to the Board of Control, Hobart House, Grosvenor Place, London, S.W.1.

Local News

SCOTLAND

New Edinburgh Professor

The chair of chemistry in relation to medicine in the University of Edinburgh, rendered vacant by the transfer of Professor Barger to Glasgow, has been filled by the appointment of Professor G. F. Marrian, D.Sc. Professor Marrian is at present associate professor of biochemistry in the University of Toronto. After studying at University College, London, and at the Medical Research Laboratories, Hampstead, he received his present appointment in 1931. He is well known for his research on the isolation of oestrin, and he is one of the leading authorities on the investigation of sex hormones, which he has carried out at Toronto.

Honyman-Gillespie Lectures

A series of eight lectures in medicine will be delivered during the autumn term in the Royal Infirmary of Edinburgh on subjects selected in relation to the weekly teaching in an intensive course on internal medicine to be held during the same period. The lectures will be given in the West Medical Theatre at 5 o'clock, and all medical practitioners are invited to attend. The lectures are as follows: "The Rational Use of Digitalis," by Dr. A. Rae Gilchrist; "Neurology—Some Modern Problems," by Dr. W. Ritchie Russell; "Psychotherapy," by Dr. T. A. Ross; "Emphysema," by Professor R. V. Christie; "Hepatitis," by Professor J. W. McNee; "Protein in the Treatment of Nephritis," by Dr. J. D. S. Cameron; "The Significance of Glycosuria," by Professor D. M. Dunlop; and "The Mechanism of Megaloblastic Blood Formation," by Professor L. S. P. Davidson.

Memorial to Dunbar Doctor

A bronze plaque with portrait medallion to the memory of the late Dr. Duncan R. Macdonald was unveiled on October 2 in the Dunbar and District Cottage Hospital. Professor P. O. Turnbull presided at the ceremony, and paid a tribute to Dr. Macdonald's services to the community of Dunbar and especially his work in the service of this hospital. Several hundred pounds had been collected for the memorial from Dr. Macdonald's friends and patients, and the sum collected sufficed to endow a bed in the hospital as well as to furnish the memorial plaque.

ENGLAND AND WALES

A.R.P. in London: Hospital and Ambulance Services

A special meeting of the London County Council was summoned on October 7 to discuss a report presented by the Air Raid Precautions Subcommittee, the chairman of which is Mr. Herbert Morrison, M.P., the leader of the Council. The report which Mr. Morrison submitted dealt mainly with three subjects: emergency fire brigade organization, the evacuation of school children, and the casualty service. With regard to the last of these, the new arrangement whereby the Ministry of Health assumes responsibility for the organization of all hospitals (clearing stations or base hospitals) for the reception of air raid casualties, although not yet embodied in formal regulations, was during the recent emergency put into operation. Two of the Council's medical staff were seconded to the Ministry in connexion with the organization of the casualty scheme, which embraces London and the home counties. Among

the measures taken were the purchase of 10,000 supplementary beds and 20,000 blankets, and the upgrading of nearly all the L.C.C. fever hospitals to the status of full surgical hospitals on an emergency basis by the purchase of additional equipment. Provision was made for emergency stocks of drugs, dressings, and serums to be maintained at all hospitals which would be used under the casualty scheme. Material was also obtained for the darkening of all hospital windows, which are normally entirely without blinds. Sufficient respirators were issued for both patients and staff. The Ministry of Health having assumed responsibility for the organization of ambulance transport in connexion with the London casualty scheme, the officer in charge of the London ambulance service was, at the Ministry's request, seconded to the Ministry. For the augmentation of the service some 2,000 vehicles were required to be adapted as emergency ambulances, and 5,000 women drivers were needed. To augment the number of vehicles available in time of war, equipment has been urgently manufactured to enable the fleet of sixty-nine vehicles used for the conveyance of children to and from special schools to be adapted within a few hours as ambulances. Arrangements were made with the London Passenger Transport Board for a large number of motor coaches to be similarly adapted. A supply of respirators for ambulance drivers and attendants was obtained from the Home Office. An organization was set up for the decontamination and repair of any damage which might be occasioned to the main drainage system in the event of war. For this purpose trained squads of men were formed from the L.C.C. main drainage staff.

In our *Supplement* this week will be found at p. 248 an account of the preparations made by the L.C.C. Hospital Service to meet the emergency had it actually occurred.

Correspondence

Civil Medical Organization in War

Sir,—Last week you published a leader on the medical arrangements needed for dealing with intensive air raids upon London. In that article it was stated that a medical committee had been appointed by the Home Office immediately after the earlier crisis of May 21, that it had worked strenuously under the chairmanship of Sir Charles Wilson, and had completed before the end of July an interim report on the methods that could be adopted for dealing with air raid casualties throughout London. Comment was then made on the fact that when September brought its graver crisis, civilian hospitals were still without Government instructions as to their precise place in the scheme of medical work.

The authorities at University College Hospital received on September 14 the information that the hospital would be expected to act as a casualty clearing station. No other instructions had been given, and the only official information to guide action was that of the A.R.P. handbooks. Thanks to the Army experience of some members of the staff who had served in France during the last war, and still more to the keenness of everyone else, the hospital stood ready for its new work by midday on Thursday, September 29. Half the in-patients had been evacuated. A complete schedule of new duties had been worked out for students, nurses, and staff with lists by name of the various teams on duty or for relief, and with precise instructions as to the place where each team would work. The operating theatres in the unprotected top floor of the hospital were replaced by extemporized provisions at a lower and safer level. A blood transfusion service was completely organized with new apparatus all assembled, the material having for the most part been given by the science laboratories of University College, and it could have provided for a hundred transfusions a day; 250 volunteers from students were typed to act as donors, and the names of nearly 500 other volunteers in the neighbourhood were registered. The hospital was ready to work as a casualty station, but no central authority had asked for any report on the progress or completion of arrangements.

One general defect is now evident as the preparations made locally at one hospital in that busy week are being reviewed. The method of recording clinical notes at length in case sheets, as used in most of the voluntary hospitals, would have broken down completely under the strain of admitting 500 or more casualties a day; nor would it have provided the clinical records that must accompany each casualty when he is moved rapidly from one post to another in a hospital, and later moved to a base hospital elsewhere. As a temporary device, quantities of luggage labels were bought, and they were to be stamped for such entries as name and diagnosis, dose of A.T. serum or morphine, etc.

If payment is to be made to voluntary hospitals for the number of civilian air raid casualties admitted, and particularly if compensation is to be given later to the individual victims of air raids, it will be essential to have all the main data about each casualty noted down in a uniform style on some cards issued by Government and belonging to Government.

During the war it was soon found that the old system of case sheets retained in each military hospital was inadequate to give the clinical information needed during the rapid transport of casualties, especially from France to the United Kingdom; but two years were allowed to pass before a satisfactory system based on small transport and index cards was evolved. Perhaps the method now intended for use by the R.A.M.C. in time of war could readily be adapted for civilian war casualties, and the Home Office Committee may have advised on this point. If so, it would be a small expense for the necessary cards to be printed at once and issued to the various hospitals. They would have an important effect as a token of the co-ordinated work that the hospitals must now definitely prepare themselves to undertake. All that University College Hospital received from the Ministry of Health was a stencilled example, copies to be made somehow and completed in triplicate, of a discharge certificate used for the Ministry of Pensions, beginning, so to speak, with the end of the story.—I am, etc.,

T. R. Elliott.

University College Hospital,
W.C.1, Oct. 10

Sir,—Your leading article on air raid casualties (October 8, p. 749) reflects the anxieties which many of us have felt in regard to the care of the sick and injured of London in the event of war. This anxiety particularly applies to the teaching hospitals, which, being independent bodies with large staffs of differing categories and numbers of medical students, must have felt the need for a more comprehensive plan for the utilization of their services than that of evacuation and conversion to so-called casualty clearing stations. A war could hardly lessen the call on their services by the sick, to whom must be added air raid casualties, and mere evacuation does nothing to provide for continued treatment. Further, the training of future doctors would be even more necessary in war than in peace, and could not be provided by casualty clearing stations.

What would seem to be needed is the establishment of large base hospitals, out of the immediate danger zone, either in existing buildings or in huts associated with each teaching hospital. To these could be evacuated existing patients if war became imminent; to them could go patients, either sick or wounded, who presented themselves to the London parent hospital and were found in need of other than immediate treatment. If their sites were correlated with the plans for the evacuation of the non-essential civil population the problems of the medical care of such refugees would be partly solved. The staff of the teaching hospital could serve both institutions, since the personnel needed for a casualty clearing station, even including the provision of mobile surgical teams for use elsewhere in London, would be well within their capacity to provide. The medical students in their clinical period could be divided between the two institutions, and would be of service at the same time as they were continuing their studies.

Such a scheme would entail the employment of the staffs on a whole-time, or almost whole-time, basis, and would necessitate their taking-over and payment directly or indirectly by the State, and the provision of safeguards such as apply to Service officers. Many other allied problems, such as the provision of accommodation for private patients in the presumed event of London nursing homes being untenable, require separate consideration. War has been happily averted for the present, but the provision *now* of adequate plans for dealing with its many-sided problems, should it occur, is no less necessary however sincerely we may hope it can be avoided in the future.—I am, etc.,

London, W.1, Oct. 8. E. G. SLESINGER, M.S., F.R.C.S.

SIR,—Perhaps we shall never know the magnitude of the widespread failures of the present A.R.P. scheme during the recent period of emergency. It would appear that the policy of the past two years has been mainly to reassure the population that there is no real danger to be feared from the air, *if* . . . This feeling has been so thoroughly disseminated during a comfortable peace that the man in the street has responded, "Then why worry?" I cannot avoid the feeling that the shortage of volunteers has been due, to some extent, to this cause.

In the *Supplement* of December 26, 1936 (p. 339), you published an article of mine on air raid precautions in which I outlined a scheme of organization, many of the features of which have since been adopted—and many have not. We are only concerned with the medical aspect, however, and before any efficient scheme can be organized there are certain fundamental principles which must be recognized but seem to play very little part in the existing arrangements.

First, there must be a definitely attested medical personnel of known strength. Secondly, there can be no efficient organization without disciplinary control, trained direction, uniform training, and adequate medical equipment. Thirdly, the A.R.P. medical organization should take the form of a corporate body on national and not municipal lines, directed by senior administrative medical officers practised in the tactical employment of medical personnel during raids; in other words, some form of A.R.P. Medical Corps. The experience of the past few weeks suggests that the whole A.R.P. arrangements also would be better on a national basis.

In my paper quoted above I mentioned the probability of a shortage of doctors and pointed out the need for training the first-aid personnel to a degree of efficiency that would qualify them to render first aid and collect casualties without medical supervision, so that doctors might be employed in posts where their skilled assistance may be used to the fullest advantage—for example, casualty clearing stations. This would clearly entail a training programme much wider and more thorough than that of the ordinary ambulance class, and it would have to be undertaken by the doctor.

Personnel should be attested under suitably modified conditions of service on the lines of a part-time Territorial Army, a minimum standard of efficiency would be required, with a compulsory annual efficiency test. Although in my paper I did not consider a uniform necessary, if it would encourage recruits by all means let them have one. It would serve to distinguish them, by night as well as by day, as trained men.

If the full story of A.R.P. could be told there would be some amazing revelations of inefficiency. There are still communities without gas-masks. In some cases *laisser faire* and crass stupidity have been incredible. Imagine, for instance, local councils, for reasons best known to themselves, appointing existing officials to the additional duties of A.R.P. officer. In some cases he has been the chief of the fire brigade. It would be difficult to imagine two more incompatible duties than these. In a raid the fire brigade would be so fully occupied with widespread simultaneous outbreaks from incendiary bombs that, being primarily a fireman, his hands would be too full to worry about A.R.P.

It will be interesting to watch developments.—I am, etc.,

H. M. STANLEY TURNER,
Brookwood, Oct. 8. Wing Commander, R.A.F.

SIR,—The scheme prepared by the Ministry of Health for converting, on the outbreak of war, special hospitals in the Central London area into general hospitals omits any recognition of the fact that nearly every member of the visiting medical staff of a hospital is attached to more than one hospital. Is it left to the surgeon's own conscience to decide which of his hospitals he shall stand by?

The question may become an acute one in a crisis. If war were declared and a Military Service Act passed, the younger men would be called up and, for one reason or another, not excluding possible casualties, many hospitals might find themselves almost denuded of their usual staff. Doubtless in time additional surgeons would be allocated by the Central Emergency Committee of the B.M.A., but such an arrangement would necessarily be less satisfactory than the retention as far as possible of the usual staff.

The problem is a difficult one, but it does seem to call for a clear-cut ruling. Perhaps the best solution would be a general recommendation to the effect that in each hospital a small committee, consisting, perhaps, of the chairman of the hospital, the secretary, and the senior surgeon, be empowered to decide the dispositions of the staff. If this were done now the hospitals concerned could settle by mutual agreement a panel of surgeons on whose services they could rely in case of emergency.—I am, etc.,

London, W.1, Oct. 10. A. RUGG-GUNN.

SIR,—I agree with every word of your leading article on this subject (*Journal*, October 8, p. 749). I have heard tales of lack of organization from others, but let me state my own experience. Some months ago I offered my services in my home district for casualty work. On Thursday during the week of crisis I found on getting

home a notice directing me to attend a certain school during an air raid. I went at once to this school: there were no preparations except rubbish bins and a couple of buckets. If war had occurred we might well have had a raid on Saturday or Sunday. Possibly dressings, splints, etc., might have arrived later, but it is obvious that it is no use collecting a certain number of doctors unless they have apparatus to use and unless a team is planned and responsible officers appointed to organize the work. I hope that the British Medical Association will use its influence with the authorities to secure that supplies and organization are ready before the next crisis arises. If the Ministry of Health delegates work to local authorities some medical man should be made responsible for each district and each unit.—I am, etc.,

W. Guyon Richards, M.B.,
Late Major, I.M.S.

London, W.1, Oct. 7.

Decline of Breast-feeding

Sir,—Dr. J. C. Spence's paper on the decline of breast-feeding (*Journal*, October 8, p. 729) is so convincing that I entertain the hope that it will do something to "stop the rot." He has set forth the psychological factors involved, but I think there is more to be said on this aspect of the question.

In the more educated sections of the community we are reaching the second generation of bottle babies; in other words, many of the mothers who renounce serious breast-feeding know that they were not themselves breast-fed. Consequently there is liable to be a latent protest: "Why should I take the trouble that mother didn't take for me?" Then there is the relatively new factor of the cigarette habit, and, whether admitted or not, it certainly influences some young mothers in favour of the bottle.

The psychology of the nurse is even more important than Dr. Spence indicates. Most maternity nurses are childless. Most of them have a strong maternal urge. (If they have not this urge they are liable to be second-rate at their work.) The resultant of these two components is an inevitable envy of the mother. In many cases, perhaps in most, it is completely repressed, but that does not prevent it from being operative. The expression of this unconscious envy is, first, to abrogate maternal functions, of which the most important is nutrition; and, secondly, to disparage the mother's capacity. Bad maternity nurses give the mother a sense of inferiority, not merely about lactation, but about every aspect of child management. "Heaven help baby when I have gone!" is a cheery jest which cuts deep. Consciously it may be only a jest; unconsciously it is meant to hurt. Thus the maternity nurse (whether she knows it or not) is prejudiced in favour of bottle-feeding in spite of the fact that it generally involves more trouble for her.

It is largely on the nurse's evidence that the doctor makes his decision. But what of his unconscious motive? Unfortunately most of us are sufficiently like other members of our race as to suffer from self-importance. Of course this regrettable item in our make-up is generally, if not always, hidden from our own eyes. This latent self-importance is the source of much obscurantism, fussiness, and solemnity throughout our profession. It makes us very averse to a policy of non-intervention. The most mischievous form it takes is the solemn warning to the husband of the primipara that a second child must not be risked. A lesser form of interference with Nature is the advice to "put baby on the bottle."

But these unconscious motives which influence the adult culminate in results for the child that are even more serious than Dr. Spence indicates. Medical psychologists are discovering daily the permanent damage that can be inflicted in connexion with infant feeding. No doubt ill-conducted breast-feeding can cause psychic traumata of great severity. So also can bottle-feeding. It, however, lacks in addition the great opportunity which breast-feeding affords. That opportunity is no less than the conditioning of the nascent social sense. Thereby the infant begins to differentiate the non-ego from the ego under conditions of instinctual satisfaction, physical well-being, and, above all, perfect security. This is the beginning of all sound social adjustment. Though these conditions can to a certain extent be imitated by bottle-feeding they can never be fully reproduced.

I hope that these considerations, in addition to Dr. Spence's cogent arguments, may influence some of our colleagues to refrain from hasty decisions in favour of "Ersatz" feeding of infants, however fashionable it may be.—I am, etc.,

H. Crichton Miller.

London, W., Oct. 10.

Sir,—I was greatly pleased to read the excellent article by Dr. J. C. Spence, and I fully agree with his wish to encourage the natural method of feeding. As a matter of fact it is one of the most important contributions to infant welfare. I would, however, like to draw attention to the question as to how many women are anatomically capable of breast-feeding. Certainly the incidence varies.

At the beginning of my pediatric career the question was much discussed. I tried to find a basis by anatomical investigations, and these were carried out in Dresden and Düsseldorf. Sections were made through the whole breast of women who had died shortly after childbirth. This was done by means of a special large microtome which enabled one to obtain a survey of the distribution of the secretory tissue. Results were uniform in both cities. The amount of glandular tissue varies within wide limits from practically nil (only fibrous tissue being present) to a condition of practically 100 per cent. secretory tissue. On the other hand, in the animals investigated for comparison this variation was not met with.

I mention these findings in order to demonstrate that there are anatomical difficulties in the way of many women feeding their children. Yet I do not quote these results in order to discourage doctors from insisting on breast-feeding. On the contrary, I would urge that it is necessary to encourage the young mother and to give her every help possible in view of the difficulties which arise in many cases.—I am, etc.,

Stefan Engel.

London, N.W.7, Oct. 8.

Prognosis of Anxiety States

Sir,—The article by Dr. Arthur Harris on the prognosis of anxiety states in the *Journal* of September 24 (p. 649) has one curious omission—the absence of any consideration of the treatment employed in the cases he describes. The results obtained by a follow-up of 123 cases, selected from the records of the Maudsley Hospital, are analysed. Thirty-eight are found to have recovered and sixty to be still suffering from anxiety states. His only reference to treatment, however, is a remark that more "energy" was expended before a case progressed from the worst grade of severity to the lightest grade than from the lightest grade to complete health, and that cases which responded rapidly gave the best results, those requiring prolonged treatment being disappointing.

Should we not expect the question of treatment to be a factor vitally influencing the results? If so, is it not necessary to know whether psychotherapy or some other form of treatment was employed, or whether some of the cases had one kind of treatment and some another? If they were treated by psychotherapy, was it merely reassurance and medicine that were given or was a form of analysis and interpretation carried out?

Unless information on these points is forthcoming can we look upon the results described by Dr. Harris as of value in enabling an opinion on the subject of prognosis to be formed? Is it possible, however, that he means to imply that treatment is not significant in estimating the prognosis in anxiety states?—I am, etc.,

London, W.1, Oct. 8. FREDERICK DILLON.

Vasomotor Rhinorrhoea

SIR,—In your issue of October 1 (p. 703) Dr. A. S. Hoseason makes a valuable contribution to the study of the fascinating problem of vasomotor rhinorrhoea and conditions secondary to the allergic nasal mucosa. The importance of his paper, in my opinion, lies in the fact that he has linked up recent advances in endocrinology with the experimental work of Myers on the nerve paths involved in the "naso-pulmonary reflex." I have myself encountered only four cases in which rhinorrhoea, asthma, and menstruation were definitely associated, so that I am unable at present to estimate the incidence of this condition; it would be interesting to hear of the experience of other workers in this field.

With regard to food sensitivity, my experience is that skin testing for this is of little value, since so many subjects are allergic to breakdown products of digestion, which skin-testing may not show; skin or mucosal tests for other allergens can be relied upon if properly carried out. For the investigation of food sensitivity the eliminating diets given by A. H. Rowe in his book *Clinical Allergy* are to be preferred.

The diagnosis of nasogenic asthma is generally easy if the cocaine spray can be employed during an attack, but, as always, an accurate "history" with particular regard to the duration of symptoms and age of onset is essential. Dr. Hoseason rightly sounds a note of warning lest in cases of asthma and bronchitis the allergic condition be overlooked and treatment directed solely to the secondary bacterial infection. The same applies to cases of so-called "nasal catarrh."—I am, etc.,

London, W.1, Oct. 4. CLIVE SHIELDS.

Function of Epithelial Cells

SIR,—The epithelial cells in the body have two well-known functions: (1) to cover and protect surfaces exposed to injury; (2) to secrete substances necessary for normal growth and metabolism. They have in addition other activities, which I think require more consideration and investigation—namely, the reactions which they cause on contact with other tissues, and also their reactions to abnormal contact with body fluids.

The syncytial epithelium of the ovum where it comes in contact with the uterine mucosa causes destruction of the epithelial and proliferation of the connective tissue elements, and when it comes into contact with the capillary endothelial lining fuses and comes into direct continuity with it.

In the process of healing, the epithelial cells, as they flow over a granulating surface, graft themselves to it by formation of a basement membrane. I hold that the formation of a basement membrane is caused by the action of a secretion of the epithelial cells on the cells of the granulation tissue. My reasons for this view are that in different places the basement membrane is modified to suit the particular requirements of the situation, and in healing after injury—if the injury is not too extensive—there is an effort to re-form the same type by resolution of the scar tissue. For instance, an extensive corneal opacity can clear up in a healthy child.

The basement membrane is also in my opinion a very important factor in the normal nutrition, health, and growth of epithelial cells. Its rupture by injury and consequent escape of circulatory fluid allow direct contact of that fluid with the epithelium, and this abnormal contact causes active proliferation of its cells necessary for repair. The abnormal proliferation ceases when continuity of the basement membrane is again established.

I think from this that there is reason to believe that substances in the body fluids which tend to cause abnormal generative activity in the epithelial cells are kept apart from them or altered by the basement membrane.—I am, etc.,

Magherafelt, Co. Derry, Sept. 26. P. HEGARTY.

Traumatic Amputation of Finger

SIR,—In regard to Dr. W. D. Park's letter in the *Journal* of September 24 (p. 680), discussing treatment of the guillotine type of traumatic amputation of the fingers, I agree that re-amputation at a higher level to obtain skin flaps is usually contraindicated. Of late I have treated cases by the immediate application of a thick Thiersch graft with pressure dressing. This has given satisfactory results. The return to work is quicker than with any dressings (usually flavine cream dressing) I have seen used, although I have not had any experience with tannic acid as described. The resultant scar contains less fibrous tissue and the graft usually takes well, in spite of the bare bone.—I am, etc.,

C. LAURENCE HEANLEY,
London, E., Oct. 8. Surgical First Assistant, London Hospital.

A Dressing for Wounds

SIR,—Regarding the sterilizing (approximately) of accidental wounds I should like to recommend a solution of iodine in glycerin or in glycerin and boric acid. (The latter is considerably denser.)

Used at a strength of 1½ drachms of the strong tincture in a pint, it is applied on a gauze packing that can be left in the wound for anything from twelve to twenty-four hours. This follows the preliminary treating of the wound with a more diffusible antiseptic, and the glycerin, whatever antiseptic it carries, provokes a very useful exudation, and secondary suturing or strapping may often be carried out. It is not, however, a good dressing to go on with, as glycerin, unless quite dilute, tends to retard healing, causing, for example, haemolysis, as has been observed experimentally (by Dr. Macleod of Leeds).

In treatment of wounds already septic hypochlorous acid (or eusol) would be much more popular if it could be obtained in a fresh state. This is how it can be done: calx chlorinata to the amount of 45 grains is rubbed smooth and put into 8 ounces of a 15 per cent. solution of sodium chloride. This may be kept for an indefinite period. When needed all one has to do is to add boric acid crystals, 45 grains or more, and one has eusol of full standard strength (or a little more) in a 15 per cent. solution of sodium chloride. But as a matter of fact one-third standard is quite strong enough for continued use so far as the eusol content is concerned, and 5 per cent. quite enough for hypertonic saline. So what one

does is to add, say, four ounces of the solution-suspension to twice the quantity of warm water, in which half 45 grains of boric acid has already been dissolved. Shake up, stand for a few minutes, and decant. The boric acid can safely be guessed as to quantity, for excess of it does no harm. The new solution should have the characteristic fresh smell, and is admirable for irrigating septic wounds or septic or doubtful uteri.

For a flat septic surface or ulcer the solution-suspension is added to double the quantity of warm water, mixed well, and enough poured on to a warmed sterilized plate to soak thoroughly, neither more nor less, a piece of boric lint that will suitably cover the wound. Oiled silk must be put on over it, and if examined several hours later the hypochlorous acid gas can still be smelt. And all this time and much longer the hypertonic saline is maintaining its activity. It is of prime importance, of course, that the liquid should not at any stage be exposed to heat much above that of the body. I have used these methods for a good many years.

The boric lint method is admirable for septic burns, but after the first two applications it can generally be used considerably weaker

Hypertonic saline solution is a very valuable dressing for ordinary burns, whether tanned or not, and I therefore suggest that hypochlorous acid in hypertonic saline solution is likely to prove a satisfactory dressing for the skin lesions of "mustard" gas.

—I am, etc.,

W. Reginald Wilson, M.B., B.Ch.

Doncaster, Sept. 26.

Social Pathology

Sir,—I agree with Dr. A. J. Brock (October 8, p. 762) that the medical profession can supplement the lessons of past history by emphasizing the pathological analogies of social defects. Those who return to society no useful service for all the care and expense of their upbringing are like tumours which collectively may become malignant. Social organizations are analogous to the neurones of the central nervous system. Their leaders are "contactors" like the synapses, and the amount of authority given to these leaders (like the blood supply of the synapses) governs their activity and the resulting conduct of society (see article *Journal*, February 5, p. 265). Just as a septic focus near the carotid artery may cause pathological changes of the cerebral capillaries and thus mental disorder, so may evil influences upon those in authority eventually determine an anti-social state.—I am, etc.,

Birmingham, Oct. 10. F. A. Pickworth.

The Services

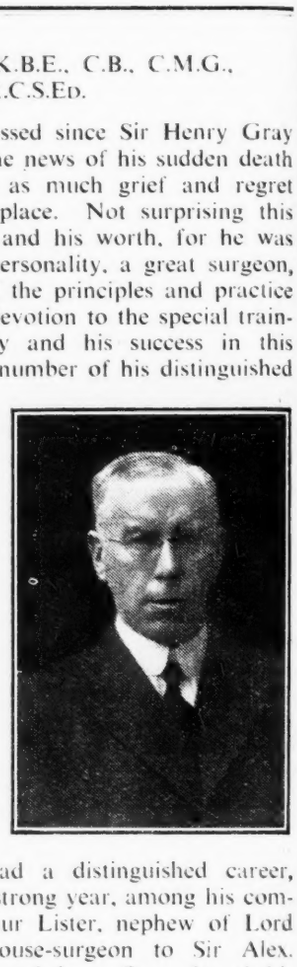
DEATHS IN THE SERVICES

Lieutenant-Colonel Phanindra Nath Basu, I.M.S., died at Vienna on July 25, aged 48. He was born on October 31, 1889, and was educated at the Calcutta Medical College, where he graduated M.B. in 1913. He joined the Indian Medical Service as temporary lieutenant on July 17, 1917, and on November 1, 1920, received a permanent commission, being ranked as captain from July 17, 1920. He took the D.P.H.Eng. in 1923, and in 1924 the D.T.M. of the London Colleges and the M.R.C.P.Ed. He attained the rank of lieutenant-colonel on January 16, 1937. He served during the latter part of the war of 1914–18. He had been a member of the British Medical Association since 1921. He was professor of pathology at the Medical College, Madras, and had held the post of deputy assistant director of pathology for the Bombay District.

Obituary

SIR HENRY GRAY, K.B.E., C.B., C.M.G., LL.D., F.R.C.S.Ed.

Though fifteen years have passed since Sir Henry Gray left Aberdeen for Montreal, the news of his sudden death on October 6 caused almost as much grief and regret as if he had never left the place. Not surprising this to those who knew the man and his worth, for he was ever a live force, a lovable personality, a great surgeon, and an outstanding teacher of the principles and practice of his art. Add to these his devotion to the special training of men bent on surgery and his success in this direction as evidenced by the number of his distinguished pupils on our hospital staffs and others, and it will be understood that the recalling of his name and worth has been a constantly recurring event up to this time and I feel will long continue.



Henry McIlree Williamson Gray was born in 1870, his father, Mr. A. R. Gray, being a prominent business man in Aberdeen. Educated at Merchiston Castle School, Edinburgh, of which he was captain, he was from 1888 to 1891 in business with his father. In the latter year he entered Marischal College to study medicine, where he had a distinguished career, graduating with honours in a strong year, among his compeers being the brilliant Arthur Lister, nephew of Lord Lister. A year spent as house-surgeon to Sir Alex. Ogston followed graduation, and here Gray found his sphere and grasped his opportunities, taking a greater interest than was usual in those days in the work of the "dressers" in the wards. In 1896 he proceeded to Germany, spending a year and a half in Bonn, Leipzig, and Berlin, studying mainly surgery and gynaecology. He left Aberdeen surgery gradually shedding some of the trappings of the antiseptic system and striving after a safe but simpler technique. He found German surgery far advanced in the development of the aseptic system, and when he returned to Aberdeen he had mastered this technique and brought much new equipment with him. He was the first here to start as a surgeon without a preliminary period in general practice. By some prominent members of the profession this was resented and for some years he had no easy row to hoe. But Gray never lacked courage and tenacity of purpose, and he pursued the even tenor of his way. After a short period as anaesthetist, and a few years as assistant surgeon at the Royal Infirmary, he got wards in 1904. A very strenuous time followed till the outbreak of war. A man of original mind, while he did his own thinking, he read widely and used his assistants to amplify his information from this source; he made frequent visits to the Continent, and from one of these brought back omnopon, with which he widened the field of local anaesthetic operation.

He was always striving after a more perfect technique, better and safer anaesthesia, and reduction of shock before, during, and after operation. One should not forget to

mention his interest in the "lost sheep" or the "forlorn hope"—the patient who had got the dreaded verdict elsewhere "too late—inoperable." To such of these as he thought had a chance and were prepared to make that choice his technique, resource, courage, patience, and physique often gave success. He considered the individual first, and the criticism of his daring that might and did follow failures in such cases affected him little, if at all. His attitude to such might be summed up in the motto of Marischal College—"They say. What say they? Let them say." He was beloved by his patients; he gained their confidence without effort, by obvious strength of body and character, his geniality and pawky humour and his forthright method, coupled with a sympathy which gave courage and cheer. He was human, however—"there are spots even on the sun"—his idealism in the surgical theatre was at times too high for the attainment of the luckless assistant who fell short of expectation, and sharp reproof rang out in no uncertain way. It rankled at times, but geniality was resumed with the casting of the operating garment and the closing of the theatre door behind him.

Gray was a patriot in no measured way. In 1899 he served as a civil surgeon in the South African War and was invalided with typhoid fever. In 1900 he was gazetted surgeon captain to the Aberdeen Volunteer Artillery, and later was a major (R.A.M.C.T.) *à la suite* in the 1st Scottish General Hospital. In 1914 he volunteered for service abroad and did not return to his practice till June, 1919. His first appointment in France was chief surgeon to the British Red Cross Hospital at Wimereux, with his fellow-student Arthur Lister in charge of the medical side. In November, 1914, he was appointed a consulting surgeon B.E.F. and was for a time in the Rouen area, and later was consulting surgeon to the 3rd Army. His keenness as a teacher was manifest in his willingness to operate and assist at operations for instructional purposes, and he did pioneer work in the treatment of wounds by excision and also in the treatment of head injuries. His technique in the latter case earned the warm approval of Harvey Cushing in a communication from France to the *B.M.J.* or *Lancet*. Having served in the forward area with every army on the Western Front, one was struck with the pains that Gray took to realize the conditions under which field ambulance officers and regimental medical officers worked. During the battle of Arras, on a "hard" day he was found near Monchy-le-Preux with gas-mask at the alert on a round of visits to dressing stations to see how they were going.

A gift he valued highly was a massive piece of silver plate inscribed with the signatures of some sixty surgeons who had served under him in France, in appreciation of his service for and with them. There is more than a touch of irony in the fact that among the signatures are a few Canadians, including Mr. Archibald, whom McGill University favoured in place of Gray, who was the choice of the Governors of the Royal Victoria Hospital, Montreal. With a complete knowledge of all the moves made by the Governors of the Royal Victoria Hospital to induce Gray to go to Montreal and the guarantees given before he accepted, combined with some reliable information from Canadian sources, it is difficult to restrain the Celtic side of one's personality in expressing one's views. Shortly, however, let us acknowledge that Gray had a "raw deal" in Montreal.

Gray was a great sportsman and played cricket in every sense of the word. He could make the ball do tricks on the ground and in the air long before spin and swerve became common terms. He was keen with the gun and fishing rod, but to me he was at his best on the snow-clad hills around Braemar and Balmoral, in a five-days hind-stalking trip in the last week of December and in the long evenings spent in that famous hostel, the Fife Arms, Braemar. His hospitality was unbounded, and many residents, young graduates, and others will recall with pleasure Sunday evenings when 34, Albyn Place was an open house.

He paid a short visit to Aberdeen in 1927; at two days' notice some fifty old colleagues held a dinner in his honour. He was as of old—no bitterness, no rancour, no upbraiding—a great surgeon—a great gentleman.

Ave et Vale. T. F.

[The photograph reproduced is by Russell, London.]

WILLIAM FLETCHER, M.D., F.R.C.P.

We regret to announce the death on September 18 at the age of 64 of Dr. William Fletcher, until recently Director of the Institute for Medical Research at Kuala Lumpur. Dr. Fletcher was educated at Caius College, Cambridge, and St. Mary's Hospital, where he gained a University scholarship in 1893. He qualified M.B., B.Ch. in 1896, proceeded to the M.D. in 1910, and in 1926 took the M.R.C.P. He was elected a Fellow of the Royal College of Physicians in 1933. Dr. Fletcher spent a few years in general practice at Coventry, and left this in 1903 to join the Government Medical Service in Malaya, where he acted as first medical officer to the General Hospital, Kuala Lumpur. In 1908 he was appointed pathologist to the Institute for Medical Research, where he worked, among others, with the late Sir Thomas Stanton, whom he finally succeeded as director. Dr. Fletcher was awarded the Craggs Prize in 1909 for his essay written in conjunction with Dr. Doris Mackinnon on beriberi. He was joint-author of a Medical Research Committee report on chronicity in dysentery carriers, and was well known for the work he had done on melioidosis. His publications on tsutsugamushi disease and on tropical typhus appeared in the *Transactions of the Royal Society of Tropical Medicine and Hygiene* in 1928 and 1929.

During the war Dr. Fletcher served as pathologist at the University War Hospital, Southampton, and except for this intermission he lived in Malaya for twenty years. When he left Malaya he became an active member of the Royal Society of Tropical Medicine, and also served as the secretary of the Colonial Medical Research Committee. He is survived by his widow and a son and a daughter.

Dr. A. Felix of the Lister Institute writes:

William Fletcher's work on typhus fever has gained for him an international reputation. In 1924, working at Kuala Lumpur in collaboration with J. E. Lesslar, he first recognized as typhus one of the continued fevers of the Malay States and called the disease "tropical typhus." In the following year Fletcher made the important discovery that there were two serological groups of tropical typhus, which could be distinguished by the agglutination reactions which the serum from the patients gave with two different strains of *Proteus X*. The two groups were later shown to have a different distribution and were referred to as shop typhus (urban group) and scrub typhus (rural group). Fletcher's observations at first appeared to be very puzzling. His work, however, has not only been fully confirmed and amplified so far as the tropical typhus of the Far East and the Japanese river fever (tsutsugamushi) are concerned; it also has had a most stimulating effect on the study of typhus-like

fevers that occur in different parts of the world. A number of diseases previously described as "unclassed fevers" that occur in various tropical and subtropical countries have been studied on similar lines and recognized as members of the "typhus group of fevers." Fletcher's work on the two serological types of tropical typhus will, therefore, mark a turning point in the history of typhus research. Fletcher was a man of quite exceptional charm. He will be remembered not only by those who were privileged by his personal friendship but also by many British and foreign bacteriologists to whom he extended his ever-ready help or advice.

E. COLLINGWOOD ANDREWS, M.D.

We regret to announce the death on October 7 of Dr. Edward Collingwood Andrews of Hampstead. Dr. Andrews was born in 1862 in London, being a son of the late Dr. James Andrews, who practised at first in the Camden Road and later in Hampstead. Collingwood Andrews was educated at University College School, and from there went up to St. John's College, Cambridge, where he matriculated in 1880 and obtained a scholarship in natural science; he took the B.Sc. degree at London University in 1882 and his B.A. at Cambridge in 1884. The M.R.C.S. he obtained in 1885, the M.B., B.Ch.Cantab in 1886 and the M.D.Cantab in 1892. After holding a resident obstetric appointment at Guy's Hospital he joined his father in practice at Hampstead.

At an early period in his career Andrews began to take interest both in the public life and in the professional work of the district. As surgeon to the Hampstead General Hospital in its early days when it was staffed by general practitioners he took his full share of the work, and he then enjoyed the full confidence of his colleagues in his judgment and in his skill as an operating surgeon. When the National Insurance Bill was being discussed he was in strong opposition to it; but when it became law circumstances were such that he, like many others, was compelled to accept it. Later in life he was called upon by the Ministry of Health to serve upon Courts of Referees in appeals under the National Health Insurance Acts, a very high opinion of his capacity as an adjudicator being held by the authorities. He was a well-known figure in the public life of the Borough of Hampstead: he served in the 19th Middlesex Rifle Volunteers; he was one of the original members of the borough council when it was first formed in 1900, and his years of service upon it amounted in all to twenty-five. During this time Andrews was elected an alderman on two separate occasions and he was appointed mayor in November, 1903, and again in 1926 and 1927. His services to the borough were considered to be of such outstanding merit that the council elected him a Freeman in 1935.

Collingwood Andrews was a courteous and a kindly man; he was popular with his colleagues and his patients; he was a man who weighed evidence and formed his own opinion. When these attributes are found together with knowledge and a judicial mind we have that combination which goes to make the best type of general practitioner and a citizen of no small worth to the community in which he lives. His opinion always carried weight whether it was on the council of his old school or on the borough council. So his life, full of service to his fellow-men, is ended, and his death will be mourned by numbers of friends, patients, and colleagues. Andrews was twice married and is survived by his widow and two sons; his elder son succeeds him in the practice founded by the grandfather.

J. E. W. MacFALL, M.D.

Professor of Forensic Medicine, University of Liverpool

Professor J. E. Whitley MacFall, whose death at the age of 65 on September 30 we record with regret, was an outstanding member of the considerable group of Liverpool students who have attained eminence in their own medical school. He qualified M.B., Ch.B. in the old Victoria University, becoming M.D.Liverpool shortly after the inauguration of the new University. He also became a member of the Inner Temple, and early took a deep interest in medical jurisprudence. After assisting the late Professor R. J. M. Buchanan for a number of years as lecturer and demonstrator, he succeeded him on his death in the chair of forensic medicine and toxicology in the University of Liverpool. MacFall also undertook the editorship of Professor Buchanan's well-known textbook, and prepared and enlarged the ninth edition, issued after the latter's death. He was a man of industrious and conscientious habits, never sparing himself in his careful consideration for the welfare of his patients, always displaying the most accurate attention to detail in the study of medico-legal problems. His conspicuous success in the solution of such problems was due no doubt to the fact that he continued in private practice even when the medico-legal work must have demanded the major part of his time and thought; this ensured the maintenance of a broad outlook, based as it was on clinical experience as well as on laboratory investigations. He served in France in the great war in command of the 3/1st West Lancashire Field Ambulance, 1914–18, and sustained a gunshot wound, from which he made a complete recovery. MacFall's wide reputation led to his extensive employment in the investigation of crime; he became a well-known expert witness in the law courts of his native city as well as further afield. He also acted as examiner of medical students in several of the universities of Great Britain. At the Annual Meeting of the British Medical Association in Edinburgh in 1927 he was honorary secretary of the Section of Forensic Medicine.

Professor MacFall was not an easy man to know intimately, but he had a circle of close friends who appreciated his sterling qualities and will sadly miss his enthusiastic and forceful personality. A tall man of athletic build, he was a familiar figure on horseback on the Mersey sands to the north of Liverpool, the first item of his Sunday routine—a ride, a game of tennis, a swim, and a game of chess—a routine which he practised beyond the age of 60. He was married twice, and he leaves a widow, and one son and two daughters by his first marriage.

THE LATE DR. HESTER DILL SMITH

Lieutenant-Colonel A. E. J. Lister, I.M.S. (ret.), late Professor of Ophthalmology, King George's Medical College, Lucknow, writes:

I would like, on behalf of myself and many other officers of the I.M.S., to pay a tribute to the memory of the late Mrs. Hester Dill Smith, M.D., of whose death a sympathetic memoir appears in the *Journal* of October 1. I and many others owe her a debt of gratitude for her kindness, encouragement, and hospitality which we can never forget.

This is not the place to attempt in any way to assess the value of the work of her husband, Lieutenant-Colonel H. Smith, C.I.E., I.M.S. (ret.). When the final history of the intracapsular extraction of cataract is written and the fires of controversy have died out, posterity will assign to him his rightful place, and it will be no insignificant one. Few, however, beyond Smith himself and a few intimate friends know how much he owed to the sympathy and practical help of his wife. It was over thirty years ago that I first met Mrs. Smith at Jullundur. To me, as

to scores of others who arrived in Jullundur profoundly sceptical as to the value of Smith's operation, her attitude was, put briefly, "Come and see it, examine the results, and judge for yourselves." This also meant to scores of visitors, as to myself, "Come and stay in my house, as my guest, for as long as you like."

It involved no small amount of trouble and expense, and this at a time when Smith had a family to educate and no great excess of worldly wealth. She, however, profoundly believed in his work, and wanted others to see it, first hand, and judge for themselves. No one who was privileged to be her guest can ever forget her charming smile of welcome, her interesting talk and shrewd observations, and her personal interest in his own particular work. She was very highly endowed intellectually, and had made good in her own sphere of work before she married. Though for the sake of her family she gave up her own professional career, no one who knew her can doubt that, had she not done so, she would have made a name for herself. She had a genius for friendship, and kept in touch with some of her husband's pupils until the end of her life. Her passing has left a gap in the lives of those who knew her well which will never be filled, and their profound sympathy goes out to her husband and her two sons.

Universities and Colleges

UNIVERSITY OF LONDON

The University of London Library, formerly at South Kensington, has been removed to its new building at Bloomsbury. In future all communications should be addressed to the Goldsmiths' Librarian, University of London Library, Bloomsbury, W.C.1.

London School of Hygiene and Tropical Medicine

The following candidates have been approved at the examination indicated:

Academic Postgraduate Diploma in Public Health.—S. N. Chelliah, A. L. St. A. McClosky, A. B. Xuma.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examination indicated:

Diploma in Public Health.—S. Ball, A. Cathcart, D. H. Williams.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

The Bradshaw Lecture on "The Chemotherapy of Bacterial Infections" will be delivered by Dr. Lionel Whitby at the College, Pall Mall East, S.W., on Thursday, November 3, at 5 p.m., and the Fitzpatrick Lectures by Dr. Harold Scott on "Conquest of Diseases in the Tropics" on Tuesday and Thursday, November 8 and 10, at 5 p.m. Any member of the medical profession will be admitted to the lectures on presentation of card.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

The autumn course of museum demonstrations in the theatre of the College commences on Monday, October 17. On that date and on October 24 Mr. L. W. Proger will demonstrate new pathological specimens in the museum. Dr. A. J. E. Cave will discuss the anatomy of the mammary gland on October 21; the anatomy of the female reproductive organs on October 28; and the anatomy of the male reproductive organs on November 4. On October 31 Mr. R. Davies-Colley will demonstrate tumours of the kidneys. All the demonstrations commence at 5 p.m., and are open to advanced students and medical practitioners.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Royal Faculty of Physicians and Surgeons of Glasgow, held on October 3, with Dr. John Henderson, the President, in the chair, the following were admitted Fellows of Faculty: James Henderson Levack, M.B., Bhutnath Raylahiri, M.B., Eliza Moira Kennedy Stevenson, M.D.

Medical News

The Medical Research Council has appointed Sir Henry Bashford, M.D. (Chief Medical Officer of the General Post Office), and Sir Kenneth Lee, LL.D. (chairman of Tootal Broadhurst Lee Co., Ltd.), to fill vacancies in the membership of its Industrial Health Research Board.

The Eugenics Society announces lectures by Dr. J. A. Fraser Roberts on "Intelligence and Family Size," Professor C. Spearman on "Intelligence Tests," and Mr. R. S. Walshaw on "External Migration," to be given at Burlington House, Piccadilly, W.1, on Tuesdays, October 18, November 15, and December 20, respectively, at 5.15 p.m.

On Tuesday, October 18, at 1.25 p.m., at the Church of St. Stephen, Walbrook, close to the Mansion House, Mr. W. McAdam Eccles will give an address on St. Luke. The offertory will be devoted to the Royal Medical Benevolent Fund.

Lord Horder will open the Finsbury Health Centre, Pine Street, E.C., on Friday, October 21, at 4.30 p.m.

"The Physiology of the Vocal Mechanism" will be the subject of the annual address to be given by Mr. Douglas Guthrie at the Central London Throat, Nose and Ear Hospital, Gray's Inn Road, W.C.1, on Friday, October 21, at 4 p.m.

A sessional meeting of the Royal Sanitary Institute will be held in the Royal Pavilion, Brighton, on Friday, October 21, at 5 p.m., when discussions will take place on "School Exclusion in Infectious Disease," to be opened by Dr. Duncan Forbes, and on "The Repair of Working-class Dwelling Houses," to be opened by Mr. A. Howard Holt.

The annual general meeting of the Society of Physiotherapists will be held at the Langham Hotel, W., on Saturday, October 22, at 2.30 p.m. At 3.45 p.m. there will be an "At Home" at which Dr. E. P. Cumberbatch will speak on "Short-wave Treatment."

A lecture on "The Anaesthetist and his Apparatus" by Dr. Victor Goldman, arranged by the Institute of British Technicians (6, Holborn Viaduct, E.C.1), will be given at the Welbeck Hotel, Welbeck Street, W., to-day (Friday, October 14), at 8.15 p.m. Tickets will be issued free to members of the medical profession on application to the secretary of the institute.

A dinner in celebration of the twenty-first anniversary of the Medical Women's Federation will be held at the Criterion Restaurant, Piccadilly Circus, W., on Saturday, October 29, at 7.15 for 7.30 p.m. It will be followed by the presentation by members of the Manchester and District Association of a short play by Dr. Mary Sheridan. The dinner will be attended by medical women only, and non-members will be welcome. Tickets, price 10s. 6d., exclusive of wines, should be obtained without delay from the office of the Medical Women's Federation, 9, Clifford Street, Bond Street, W.1.

Dr. P. del Rio-Hortega will give two lectures on "The Histology of the Nervous System" at the Nuffield Institute for Medical Research, Woodstock Road, Oxford, on Wednesdays, November 2 and 9, at 8.45 p.m.

The South-West London Medical Society will hold the following meetings during the next five months: October 19, Dr. D. Evan Bedford, "Functional or Organic?—Difficulties in the Diagnosis of Heart Disease." November 9, Mr. Laurence O'Shaughnessy, "Indications for Cardiac Surgery." December 14, Mr. Gavin Livingstone, "An American Interlude." January 11, Dr. E. ff. Creed, "Laboratory Diagnosis as a Guide to Treatment." February 8, Mr. Leonard Phillips, "Pelvic Disproportion." The meetings are to be held at the Bolingbroke Hospital, Wandsworth Common, S.W., on Wednesdays at 9 p.m.

An exhibition by the Medical Art Society is now open at the Rembrandt Gallery, 5, Vigo Street, London, W.1, and will close on October 29.

The following programme for 1938–9 has been arranged by the Hunterian Society: October 17, 7.15 p.m., at Simpson's Restaurant, Cheapside, E.C., presidential address by Mr. Andrew McAllister, "The Influence of the Hunterian Era on Modern Obstetrics." November 7, 9 p.m., at Apothecaries' Hall, Water Lane, discussion: "That Psychological Treatment of the Criminal is Preferable to Punishment of the Crime," to be opened by Mr. St. John Hutchinson, K.C., Dr. H. Yellowlees, Mr. Albert Lieck, and Sir Holman Gregory, K.C. December 19, 7.15 p.m., at Simpson's Restaurant, E.C., discussion: "Sneezing," to be opened by Dr. George Riddoch, Mr. C. Hamblen-Thomas, and Dr. George Bray. January 16, 9 p.m., at Mansion House, E.C., Hunterian Lecture by Professor Emil de Grosz of Budapest, "The Problem of Glaucoma." February 9, 7.30 p.m., annual dinner at May Fair Hotel. February 27, 9 p.m., at Mansion House, Hunterian Oration by Mr. Cedric Lane-Roberts, "A Plea for the Woman in Gynaecology and Obstetrics." March 20, 7.15 p.m., at Simpson's Restaurant, E.C., discussion: "Misleading Leading Symptoms," to be opened by Lord Horder and Mr. W. H. Ogilvie. April 17, 7.15 p.m., annual general meeting, followed by lecture by Dr. C. Ainsworth Mitchell, "Identifications in Criminology."

The Minister of Health has appointed Dr. Albert Edward Quine, a Medical Officer of the Ministry, to undertake the duties of Inspector of Anatomy in England and Wales.

The Board of Control, with the approval of the Minister of Health, has appointed Dr. R. G. Anderson to be a Commissioner to fill the vacancy caused by the retirement of Surgeon Rear-Admiral J. Falconer Hall, C.M.G., R.N. (ret.).

Dr. Rufus Cole, director of the Hospital of the Rockefeller Institute since 1909, received the George M. Kober Medal for distinguished service to medicine from the Association of American Physicians at its annual meeting.

EPIDEMIOLOGICAL NOTES*

Acute Poliomyelitis

The incidence of acute poliomyelitis in England and Wales continues to decline, 56 cases being notified during the week under review, compared with 60 in the previous week; in London the figure remains at 3, but in Scotland a drop from 10 to 5 was recorded. The counties mainly affected were: Staffordshire 5, 4 each in Carmarthen, Essex, and Sussex West, and 3 each in Suffolk West, Yorkshire East Riding, and Yorkshire North Riding. More than one case was reported from the following centres: Horsham 4, London 3 (Battersea, Holborn, and Wandsworth), 2 each in Birmingham, Carmarthen, Cannock, Cosford (Suffolk), and York. In Essex and Suffolk fresh cases continue to be notified at intervals: in addition to those mentioned, single cases were notified in Braintree, Saffron Walden, and Sudbury (Suffolk). The outbreak in Carmarthen continues, the areas affected being Carmarthen 2, Llanelly 1, Carmarthen rural 1. Although no fresh cases were reported in Llandilo rural district for the week, there have been 5 cases altogether, 4 of them confined to a small area in Salem, with 1 death. The Horsham cases occurred at an interval of nearly four weeks from the last case notified.

A decline in the prevalence of acute poliomyelitis has been reported from the Continental countries in which the disease has been epidemic. During the week ended September 17 in Germany the number notified declined from 419 to 386; the chief centres were: district of Cologne 80 (97), district of Düsseldorf 19 (27), district of Wiesbaden 27 (29), district of Frankfort 15 (9), Württemberg 55 (72), Baden 16 (13), Saar 13 (17), Saxony 33 (33), and Bavaria 50 (33). During the same week in Austria there were 18 (39) cases. In the week following in Holland notifications fell from 54 to 30, of which 8 (26) were in the Province of South Holland. France has been relatively free from the disease: during the whole of August only 81 cases were notified, distributed over thirty-two departments, chiefly in: the Department of the Rhône 12, 6 each in the Departments of the Seine, Bas-Rhin, and Côte d'Or, 5 in the Ain Department, and 4 each in the Departments of the Isère and Haut-Rhin.

Primary and Influenzal Pneumonia

The increase in the incidence of pneumonia (primary and influenzal) in England and Wales referred to last week has not been maintained, the number of cases notified having fallen to practically the same level as in the previous week. Of the 16 deaths in the 126 Great Towns there were 3 in Liverpool and 2 in Southport.

Diphtheria and Scarlet Fever

There was a slight increase in the notifications of diphtheria in England and Wales during the week—1,209, compared with 1,198 in the previous week—but in London a decrease was reported (from 152 to 129). The chief centres affected were: Plymouth 12 (9), South Shields 18 (13), Manchester 27 (19), Leicester 24 (14), Cannock 11 (1), Birmingham 35 (24), Carmarthen 5 (1), Cardiff 14 (7). In Scotland a small drop was recorded: Glasgow 70 (65), Edinburgh 21 (17), West Lothian County 11 (4), Lanark 10 (12), Renfrew 8 (11). Of the 30 deaths in the 126 Great Towns of England and Wales 3 each occurred in London, Leicester, and Liverpool, and 2 each in Birmingham and South Shields. There has been no abatement of the outbreak in South Shields, where there have been 365 cases to date this year with 54 deaths: notifications for the last four weeks were 15, 16, 13, and 18 respectively, and for the same periods 0, 2, 3, and 2 deaths respectively were recorded. A campaign by the public health authorities for immunizing the population at risk against the disease has met with a good response, but from the nature of things immediate results cannot be expected. Four deaths from diphtheria were recorded in Glasgow and 1 each in Edinburgh and Paisley.

Further increases in the incidence of scarlet fever were recorded in England and Wales and in Scotland, but in London there was a drop from 160 to 155 in the week under review. The chief increases were reported from: Stockport 10 (6), Poole 8 (5), South Shields 16 (7), Stockton-on-Tees 9 (6), West Ham 22 (15), Barnet 8 (0), Gillingham 8 (1), Bootle (Lancs) 17 (6), Liverpool 46 (43), Manchester 34 (23), Nottingham 31 (26), Croydon 7 (4), Sheffield 35 (18). During the week only one death (at Twickenham) was recorded in the 126 Great Towns. There were no deaths from scarlet fever in Scotland or Ireland.

Measles and Whooping-cough

Three deaths from measles (1 each in Kingston-upon-Hull, Sunderland, and Stoke-on-Trent) were recorded in the 126 Great Towns of England and Wales, compared with 2 in the previous week. In Scotland the notifications fell from 18 to 13 in the week under review, the chief centres being Glasgow 6 (4), Kirkcaldy 2 (1), and Lanark 2 (2). Of the 10 deaths from whooping-cough in the 126 Great Towns, 1 each occurred in London, Hastings, Bootle, Huddersfield, Kingston-upon-Hull, Liverpool, Birmingham, Nottingham, Norwich, and Swansea. In Scotland there was an appreciable drop in the notifications of whooping-cough—94, compared with 125 in the previous week. Three deaths were recorded (2 in Glasgow and 1 in Aberdeen).

Cholera: Plague

During the week under review 113 cases of cholera and 38 deaths were recorded at Shanghai, while in Eastern Kwangtung during the week ended September 17 there were 526 cases and 116 deaths. During the week ended October 1, 3,463 cases of cholera and 1,526 deaths were recorded in the Central Provinces of India and 237 (211) cases and 122 (93) deaths in the United Provinces.

In India during the week ended October 1 there were further increases in the incidence of plague: Central Provinces 166 (116) cases and 7 (6) deaths; Madras 35 (18) cases and 15 (15) deaths; Bombay 21 (14) cases and 20 (14) deaths.

* Except where otherwise mentioned, figures in parentheses refer to the week preceding the one under review.

No. 39.

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended October 1, 1938.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns (124 in 1937) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1938					1937 (Corresponding Week)					1929-37 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	18	2	7	—	1	14	3	4	—	—		
Deaths		1	1				—	—				
Diphtheria	1,209	129	195	55	25	1,348	179	183	44	24	1,152	195
Deaths	30	3	6	2	—	24	5	5	—	—		
Dysentery	27	6	19	—	12	40	10	33	—	—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	2	—	—	1	—	9	—	—	—	—		
Deaths		—					2					
Enteric (typhoid and paratyphoid) fever	41	4	8	8	1	32	3	7	9	2	67	
Deaths	1	—	—	—	—	1	—	—	—	2		
Erysipelas			55	12	3			60	8	4		
Deaths		—					—					
Infective enteritis or diarrhoea under 2 years												
Deaths	40	9	8	8	4	56	11	11	9	7		
Measles			13		2			39		2		
Deaths	3	—	—	—	—	8	1	—	1	—		
Ophthalmia neonatorum	78	5	31		—	102	13	37		—		
Deaths												
Pneumonia, influenzal‡	448	33	5	—	13	675	51	9	1	2	557	51
Deaths (from Influenza)	16	—	2	1	—	25	2	—	1	—		
Pneumonia, primary			160	9				192	6			
Deaths		15		9	6		16		11	6		
Polio-encephalitis, acute	—	—				7	2					
Deaths		—					—					
Poliomyelitis, acute	56	3	5	1	—	30	3	1	—	—		
Deaths		1					1					
Puerperal fever	3*	3	21	6	1	32	3	15	—	—		
Deaths		2†					2†					
Puerperal pyrexia	166	14	28		2	171	20	29		2		
Deaths												
Relapsing fever	—	—			—	—	—	—		—		
Deaths												
Scarlet fever	1,776	155	380	58	77	2,503	198	493	69	86	2,233	315
Deaths	1	—	—	—	—	5	—	—	1	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—				—	—		
Whooping-cough			94		7			40		12		
Deaths	10	1	3	2	1	8	—	—	1	2		
Deaths (0-1 year)	290	38	45	38	10	290	39	55	36	19		
Infant mortality rate (per 1,000 live births)	48	31				48	32					
Deaths (excluding stillbirths)	3,919	713	539	177	104	4,006	765	543	183	128		
Annual death rate (per 1,000 persons living)	9.6	9.1	11.0	12.0	9.2	9.9	9.6	11.1	12.5	11.3		
Live births	6,521	1,250	807	407	201	6,320	1,199	801	386	219		
Annual rate per 1,000 persons living	16.0	15.9	16.4	27.6	17.8	15.6	15.1	16.4	26.3	19.4		
Stillbirths	275	36				259	34					
Rate per 1,000 total births (including stillborn)	40	28				39	28					

* After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

† Deaths from puerperal sepsis.

‡ Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Infrequent Menstruation

"W. A. C." writes: A girl aged 17 complains that her periods since their commencement three years ago have appeared only once every three months. She complains also of offensive leucorrhoea at about the times when her periods might have been expected if they were more normal. She has a marked growth of hair on the upper lip. She worries, and is anxious for treatment. What can be done for her?

Treatment of Buccal Ulcers

Surgeon Lieutenant-Commander J. C. GENT writes with reference to Dr. R. E. Isaac's letter (*Journal*, October 1, p. 727): I suggest treatment along the following lines: (1) dry the ulcers with cotton-wool; (2) apply 8 per cent. zinc chloride for one minute; and (3) paint with Talbot's solution (zinc iodide, 110 grains; distilled water, 82 minims; iodine crystals, 183 grains; glycerin to 1 oz.). This procedure is advised in Hutchison's *Index of Treatment*. I had occasion to try it last year in the case of my own father, then a man of 75, who had suffered from buccal ulcers for about five years. It appeared to give him more relief than any other treatment which had been tried, although the condition never recovered completely.

Dr. R. HERSON writes in answer to Dr. R. E. Isaac's inquiry: I would advise that the buccal ulcers be painted with 1 per cent. aqueous gentian-violet twice a day.

Treatment of Pruritus Ani

Dr. W. A. MARRIS (Birmingham) writes: "J. M." will find he can give his patient prompt relief by dusting the anal folds with calomel undiluted by any other powder. Direct the patient to smooth a pinch of the powder into the folds round the anus on going to bed. Two drachms is sufficient for relief, but relapses will occur after months. I mentioned this treatment to a skin specialist, and the next time we met he thanked me for the tip.

Dr. J. JONES (Kinmel Bay, Rhyl), as one who has suffered from this distressing malady, and who cannot even now claim to be absolutely free from it, writes: I attribute my greatly improved condition to the following lines of treatment: (1) a course of *x*-ray therapy at the hands of a capable radiologist; (2) the use of anusol suppositories, which contain bismuth oxygallate, zinc oxide, balsam of peru, etc. (William R. Warner and Co. Ltd.); and more recently (3) to the use of "nohaesa" suppositories and ointment, which may be obtained from Homburg Pharma Ltd., Africa House, Kingsway, London, W.C.2, and contain camphor-chloral-menthol, together with camomile extract and calcium chloride. They are sedative in action and impart a grateful sensation of coolness to the affected parts.

"R.A.M.C.T." writes: At the end of the war, travelling homewards in a miserable little steamer, I contracted an acute condition of pruritus ani. After perhaps six weeks of exudative eczema and great discomfort I adopted the plan of sitting in a hip-bath of warm sodium bicarbonate solution every two waking hours for twenty minutes at a time. I was completely and permanently cured within three days. A friend with the same trouble followed my advice with the same happy result.

LETTERS, NOTES, ETC.

Medical Golf

The Medical Golfing Society held its autumn meeting on the Royal Cinque Ports Golf Links on October 1 and 2. The attendance was smaller than usual owing to the political situation, but a most enjoyable week-end was spent, with the following results. Bogey singles: Mr. L. G. Brown, 3 up (12). Foursomes: Sir Harold Gillies and Mr. John Everidge, after a tie with Dr. W. Dale and Dr. S. Pope at 1 down. Canny Ryall Cup: (1) Dr. S. Pope 86 − 12 = 74; (2) Mr. F. McG. Loughnane 89 − 14 = 75; (3) Dr. J. J. N. Daniels 93 − 15 = 78.

Disclaimers

Dr. DENNIS EMBLETON writes: A sensational article recently appeared in a London daily newspaper in which my name was mentioned. It referred to a paper by me on the dietetic treatment of diabetes which was published in the *Proceedings of the Royal Society of Medicine*. The newspaper article condemned the use of insulin, and was couched in such terms that it has evidently led many diabetics to believe that insulin is no longer necessary. During the last two or three weeks I have been bombarded with letters from diabetics, as have others engaged in this work. The remarks in the letters range from the pathetic request that the "new treatment" should be given, to downright abuse at having been subjected to the "torture of the syringe" for so many years. As can be seen on reference to the original paper, no such claim was made by me. My paper was a plea for the more extensive use of diet in the treatment of diabetics over the age of 40. The complete withholding of insulin in all cases was never suggested: such a procedure would be obviously dangerous, particularly in diabetics of the young age group.

Sir HAROLD WERNHER, Chairman of the Voluntary Hospitals Emergency Bed Service, writes from 10, Old Jewry, E.C.2: In the broadcast which took place in the London Regional News at 10 o'clock on Friday last concerning this Service the B.B.C. wished to give a realistic impression of how the work is carried out. In order to do this they broadcast the Emergency Bed Service end of an actual conversation with a doctor. Unfortunately, and quite unintentionally, the name of the doctor was also broadcast. I need hardly say that it was never intended that this should occur. On behalf of the doctor in question I should like to make it clear that he was in no way aware that his name would be broadcast, and would certainly not have given his permission for it had he known.

Corrigendum

Dr. WILLIAM BROWN, Director of the Oxford University Institute of Experimental Psychology, writes: On page 770 of the *Journal* of October 8 there appears a paragraph about psychology at Oxford which is quite incorrect. It was in 1936 that the Institute of Experimental Psychology was founded at Oxford with the help of Rockefeller grants and, in particular, with the help of a generous gift of £10,000 from my friend Mrs. Hugh Watts. The event is described in my article on "Psychology at Oxford," published in the *British Medical Journal* of May 30, 1936—although at that time Mrs. Hugh Watts preferred to be anonymous. At a private dinner which my wife and I gave in Christ Church Hall on July 31 of this year, during the meeting of the tenth International Medical Congress for Psychotherapy, to about seventy people, including delegates of the Congress, in honour of the president, Professor C. G. Jung, Mrs. Hugh Watts was the other principal guest. I explained in a short speech at the end of the dinner the circumstances in which her generous gift was made to the University when the Institute of Experimental Psychology was founded in 1936.